SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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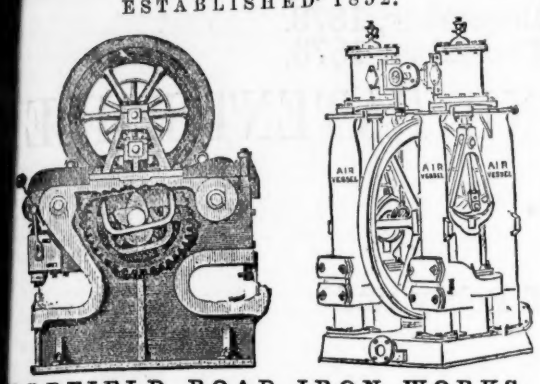

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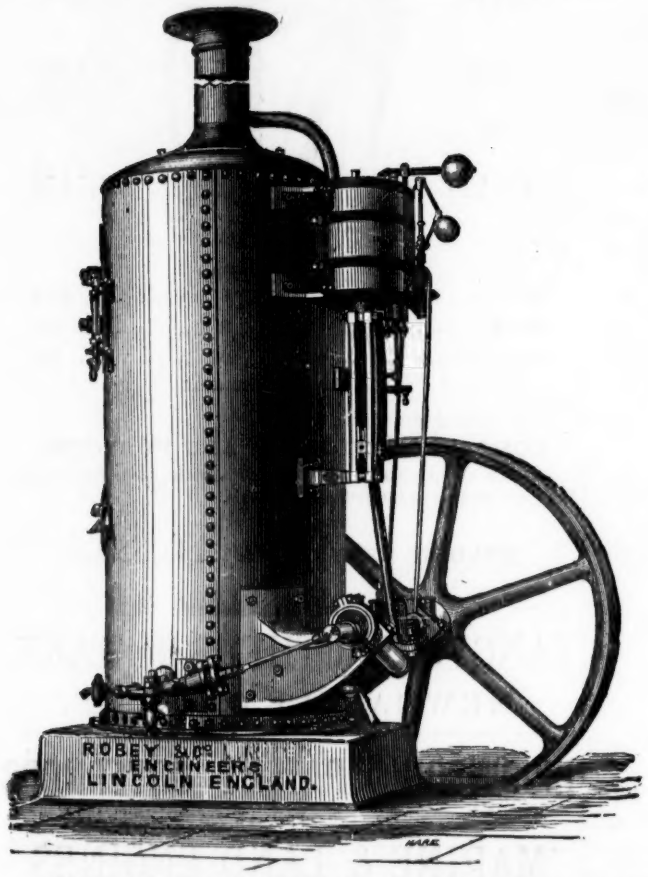

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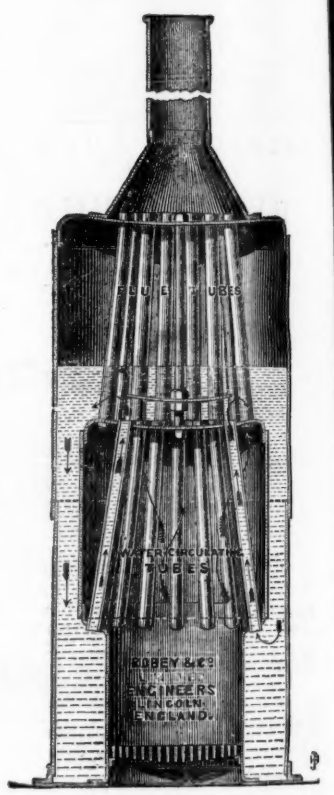

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Original Correspondence.

COAL-CUTTING MACHINES—"MONITOR" AND "PICK."

SIR,—In the *Mining Journal* of last week you were good enough to invite me, in complimentary terms, to express my opinion upon the relative merits of the two principles of construction of machines for cutting coal—the "circular saw" and the "pick" motion. The suggestion appears to have come from a reputed success of an American machine, named by its inventor the "Monitor," and of which you gave, in the Supplement to the Journal of March 27, an illustrated article, written by Mr. J. S. Alexander, of Philadelphia. The principle of this machine is exactly the same as several machines invented for the same purpose in this country, which have been working, more or less, for many years preceding the production of the "Monitor;" and although it is varied from the English model in some details, not of much importance, I do not see that it can be considered, on the whole, as any improvement upon its predecessors. In forming this opinion I take the data supplied by Mr. Alexander, and as I know him to be a gentleman of high position in the United States, implicit reliance may be placed upon that data. That the machine in question will perform the act of making a groove in the face of the coal is not to be doubted, and under favourable circumstances it may do its work well, but I infer, from the illustration given by you, that the mine of Messrs. Niblock, Zimmerman, and Alexander is exceptionally favourable; indeed, I have been through many coal mines in Europe and America, and I have never seen so charming a coal pit.

If I were to admit that the Monitor is mechanically the best of its type, that would not determine its value, because, after all, the commercial results must settle the matter, and Mr. Alexander's figures enable us thoroughly to gain information upon that paramount quality of the invention. The machine in question is a very large circular saw, with 84 loose teeth forward, and 84 in reverse, all set on the edge of the plate, and revolved horizontally, by rim-gearing, on the periphery of the saw-plate, the power being supplied from a compressed air-engine, mounted on a frame, which traverses the face of the coal, and is drawn forward by a chain as the cavity or groove is excavated by the revolutions of the saw. Each revolution of the plate removes about ¼ in. of the solid coal, and six revolutions occupy about a minute of time, so that 2½ yards of face length to a depth of 56 inches seems to be the average work of the Monitor per hour, and out of this 5 tons of coal will be got, giving for the day of 10 hours 50 tons. Mr. Alexander says that the plate is 60 in. in diameter, but he has fallen into a slight mistake as to this, because he states that the groove is made 56 in. deep, and that ⅛th of the plate is outside the face of the coal, so that the diameter must be 64 in. I only name this difference here as even 4 in. may have an importance in considering the passing of the machine through the narrow workings and turnings of an ordinary coal mine, in a large number of which the working faces are little over 3 ft. from the coal to the props, and from the floor to the roof.

The ingenuity of the English mechanical engineers has been remarkably persistent for many years in endeavouring to produce a machine on the rotating principle which would surpass the simple pick machine—the real pioneer, or monitor—in all useful work at cutting coal by mechanical means, but up to this date no such results have attended their labours. When the pick was first harnessed to compressed air the number of believers in its success was small indeed. Now there are a dozen "successful" inventions, and the question is apparently merely a matter of selection, and those who have to select want information. But it is a far larger subject than the mere cutting, for the surrounding circumstances of a colliery have to be taken into account, and these are numerous. The standing up of the roof and coal, the width of face that can be kept open, the freedom from pyrites or other hard substances, the strength and durability of the machine and its portability, and, above all, "how much will it cost to do it?" Comparing the circular-saw principle with that of the pick, the relative cost of power is a little surprising. One rarely gets a glimpse of that part of the subject; indeed, I have no recollection of having ever seen it touched upon by any advocate of the "revolver" principle; but, this part of the subject being of the highest importance, I will endeavour to make it more clearly understood by those who desire the knowledge. Mr. Alexander has not given the pressure of the compressed air, nor the size of the trunk, nor is he very specific in some other, though not material, points.

The diameter of the cylinders (two) is 9 in.; stroke, 8 in.; and speed, 180 per minute. In the absence of the precise pressure, I have adopted 40 lbs. on the square inch, and, for the same reason, I have had to take the full area of the cylinders; but the calculation of consumption of air will be allowed for afterwards. The cube feet of air is 212 per minute. Thus:—

$$\frac{63{\cdot}6 \times 8 \times 2 \times 180}{1728} = 106 \times 2 = 212.$$

If the circular-saw machine can be worked expansively at 40 lbs. pressure, and cut off at half-stroke (which I very much doubt, as the revolving plate has 84 points in constant resistance, there can, I think, be no momentum), then it will be—

$$\frac{2 \times 63{\cdot}6 \times 34 \times 180 \times 1{\cdot}3}{33{,}000} = 30 \text{ h.p.}$$

The average pressure 34 lbs. And $212 \times 60 = 12{,}720$ ft. per hour, and $5 \times 2544 = 12{,}720$. It thus appears that there is an expenditure of 2544 cubic feet of air to every ton of coal, and, if the cost of compressing air be taken at 6d. per 1000 ft., then its cost will be in power alone 15¼d., subject to the indicated reduction effected by the employment of the trunk.

Taking the relative merits of the pick machine for competitive purposes into consideration, and employing corresponding formula to that used for the Monitor, the question will stand thus, viz.:—This machine has but one cylinder of 7 in. diameter, stroke 12 in., and speed 60 per minute, with the pressure of air 40 lbs., and working in a 4 ft. seam of coal, cutting a groove of 36 in. deep, every yard of face will yield 28 cwts. of coal, and 7½ yards, or 10 tons per hour, is 100 tons per day of 10 hours. The cube feet of air consumed is 30 per minute. Thus:—

$$\frac{38{\cdot}4 \times 12 \times 60}{1728} = 15 \times 2 = 30.$$

Taking the cut-off to be the same as the Monitor, at half-stroke, it will be thus:— $\frac{38{\cdot}4 \times 34 \times 120}{33{\cdot}000} = 4{\cdot}75$ h. p.

The average pressure 34 lbs. And $30 \times 60 = 1800$ cubic feet per hour, and $10 \times 180 = 1800$. It thus appears that there is an expenditure of 180 cubic feet of air to every ton of coal, and the cost of compressing the air being taken at 6d. per 1000 ft., then 1 1-12d. will supply the power for each ton of coal cut.

The employment of a trunk engine in the Monitor will effect a saving of air on one side of the piston, and, if this be taken at 1-5th of the previous estimated cost of 15¼d. per ton, it will now be reduced to 12 1-12d., showing a difference in favour of the pick of 11d. per ton of coal cut. I think I have no need to carry the comparison any further.—*Burley Wood, Leeds, April* 13. WILLIAM FIRTH.

P.S.—Mr. Alexander mentions that by the use of "chrome steel" for the scratching points a great difficulty has been got over. I may mention that four years ago I obtained some "chrome steel" from New York for making cutting-points for the pick, but I did not find it equal to the best Sheffield steel.—W. F.

EXPLOSIVES USED IN BLASTING.

SIR,—Everybody must feel grateful to Mr. Orlando Webb for his interesting statements made in last week's Journal as to the results of working in various mines, &c., with dynamite, guncotton, and gunpowder; but in taking upon himself the contradiction of my statement that dynamite had never been extensively used in Cornwall because it had been found that the difference in power and effectiveness had not warranted the purchase of the more expensive dynamite, he should have seen that I made the statement with reference to Cornwall alone; and as this is the case, his challenging my statement is totally uncalled for, unnecessary, and unsubstantiated.

Three years ago dynamite was in common use by the miners in the Camborne district, and if it was found to be superior, why is it not in use to-day?—for now it is used in very few mines by very few men. It was proved that neither in shafts or winzes, in ends or stopes, was it superior to gunpowder as used by the miners, price for price. No power was gained, no time, and as to progress, things remained in their former condition. In very wet ends dynamite was applied with a slight advantage, in "vughy" ground it was decidedly superior; but in the ordinary hard granite rock gunpowder held, and still holds, its own. Why did dynamite, which has succeeded elsewhere, not succeed in Cornwall, and why was not the boring-machine introduced until it had been established as a valuable invention? Are the Cornish so slow of discernment, so lacking in enterprise, and discrimination, and pluck? They used not to be so. Such a Cornwall never produced a Trevithick, a Grose, a Murdock, a Savary. Is all enterprise to be crushed by a fall in the copper market? But the failure of dynamite was, perhaps, owing to a different cause—different from ignorance or prejudice, though they helped its failure. Placed in the hands of the often unintelligent miner, accustomed to the use of gunpowder, and practically ignorant of the proper mode of its application, some considerable time is necessary to make him understand that an overcharge will result in suffocating smoke, &c. So he wastes the material by an extravagant use, and finds himself half choked and made absolutely ill by the suffocating irritant nitrous fumes, and, imputing this inconvenience not to his own lack of knowledge, but to some disagreeable quality of the dynamite, he will condemn it. I have often visited mines where dynamite was in use, and seen the effects of the blast. It is terribly powerful, it burns and pulverises the rock; but if it was superior to gunpowder it would have been found out before this, especially as in many mines the miners, whilst paying 1s. per pound for gunpowder, only paid 2s. for dynamite. One remarkable property has dynamite—that of expending its force downward, whilst gunpowder only explodes with the greatest force upwards, so that it might be used, even in Cornwall, in conjunction with gunpowder. A. B.

ROAD-LOCOMOTIVES FOR TRAMWAY TRACTION.

SIR,—The thought to employ other motors in the place of animal force for metropolitan communication is of no recent date, although it must be admitted that at the present time we have only succeeded in obtaining the practical results of various plans, whose significance we may best remember by the partial or entire failure in which they have resulted. It will, therefore, be well worth our while to give our attention to the present subject, and to consider some of the reasons which may be attributed to this certainly hitherto singular issue in the application of other motors for town or city communication. The most important consideration in the construction of road-locomotives for passenger traffic in the crowded streets is the prevention of smoke, coupled with the free escape of steam into the surrounding atmosphere; the action of either of these causes would from a sanitary point of view become a nuisance, and in subterranean traction in particular would be quite inadmissible. Thus, this consideration presents one of the characteristics of such road-locomotives, which condition need not be observed in the same degree with our railway-locomotives. The second consideration, which is very closely allied to our first, inasmuch as it is also one which must be observed in the design and construction of the machine in question, is that a road-locomotive should work silently, for it is very evident that any noise made when working might lead to very disastrous results in frightening spirited horses, which it would be sure to meet when travelling.

The observance of these two forementioned conditions form the basis of all designs of road-locomotives, and these primary considerations are unquestionably the characteristics of this class of construction. Of secondary, yet still great, importance, all road-locomotives should be made to be easily controlled, simple in design, with a rapid stop-motion, and offer as little danger as possible.

The first consideration we had in view naturally excludes all types of locomotives as we find them on our railways, for, although it cannot be denied that some locomotive constructions show satisfactory results in the consumption of their smoke, still their application to road-traction in cities would be coupled with other obstacles, which would render their general introduction if not impossible, yet difficult. We must, therefore, try to steer clear of these, and seek other more advantageous substitutes in their place. Amongst the latter we may discuss the following systems:—1. Generating steam by means of gas, and subsequently condensing the steam in the tender.—2. Driving by steam from a boiler with a certain quantity of water and steam pressure, with condensing apparatus likewise attached.—3. Direct application of illuminating gas for driving.—4. By the use of petroleum.—5. Compressed air.—6. Caloric machine, with gas firing.

We may conveniently reduce these systems into two:—1. In those in which the motive power is not directly allowed to escape into the surrounding atmosphere; such, for instance, where steam is employed.—2. Into those methods in which the motive power is immediately allowed to escape free, as might take place with gas, petroleum, compressed or heated air. The advantages which these last-mentioned methods possess over the former are at once apparent from this grouping. All condensing apparatus naturally take up room, and, in addition, they require much water, which necessarily renders them costly engines to work. A further objection which might be raised to their disadvantage is that they may be said to destroy a certain quantity of potential work in the waste steam which could never have been used very expansively, and which in the ordinary locomotive may be said to be further utilised in creating a draught. Reducing the back pressure is in their favour.

Referring to the first system named, we find a very simple manner of firing without smoke. It would entail a gas receiver, which need not be of large dimensions, since it might be easily filled at short intervals in towns without great delay or trouble. The steam may either be condensed by a jet, or surface condensing may be applied, although the former is preferable on account of its taking up less room. The locomotive in this instance would likewise work the pumps, and in order to increase the adhesive power might be constructed on the tender principle to overcome heavy gradients. With the second system, firing not being required, no fuel is carried. Owing to this, however, we have no constant but a continually decreasing pressure in the boiler, and consequently the expansion of the steam must be regulated by hand. The condensing apparatus may be constructed as with the preceding system, and this system, as well as the preceding, would require supplies of water at intervals for condensing purposes, as well as for feeding the boiler of the former. The manner in which gas may be applied, as suggested in our third system, is well known in small plants. For the present purpose it is less adapted on account of its irregularity and sudden action. Water for condensing purposes would be likewise required. Moreover, this system possesses two drawbacks; its irregular and noisy action must act detrimental to its interest. The supply of gas need not be large if renewals can be taken in at short distances. Similar remarks apply to the fourth system—the petroleum motor—inasmuch as it is noisy of action, irregular in motion, besides being the most costly to work. Advantages of these two last systems are easy attendance and compact arrangements.

The application of compressed air requires a more careful consideration; it possesses all the advantages claimed by the use of steam; it has a regular and noiseless action, and requires no firing or condensing apparatus, thus removing these great inconveniences inherent to the use of steam. On the other hand, it entails a varying expansion on account of the decreasing pressure, and this method has other disadvantages. The compressed air causes a very high temperature, which renders it next to impossible to lead the air direct to the cylinders without destroying the packing in the stuffing boxes, besides preventing lubricating; a cooling down is, therefore, required. The cooled air becomes, however, so cold on expanding that the valves are liable to become choked with ice. Besides, the pumping machinery required with this system increases the cost of the machine, and renders the same more costly than the use of steam would require. The attendance becomes difficult, and requires the whole attention of the engine-driver to maintain one uniform speed. If high compressed air be used the receiver need be but very small, yet the practical limits must not be exceeded.

The last system enumerated is gas-firing for generating heated air. It likewise possesses all the advantages enjoyed by the use of steam without its condensing evils. The sole disadvantage it has consists in the small effective piston-pressure, thus requiring the pistons to be made very large, and as a consequence the machine anything but compendious. On the other hand, this may be said to increase the adhesive power, and may be looked upon as an advantage. The attendance required is insignificant, and the working outlay may be put on an equal footing with that of a steam-engine. If we now compare the various systems *ensemble* we shall further find that the first system enumerated is the most dangerous, and might lead to the most disastrous results in the hands of incompetent and unintelligent drivers. From a safe point of view the last system is unquestionably the safest. We may, therefore, make the following summary of our systems:—1. Costly machine, large water supplies, cheap working, easy management, great danger, noiseless action.—2. Costly machine, large water supplies, cheap working, difficult management, little danger, silent working.—3. Costly machine, little water supply, expensive working, easy management, little danger, noisy and irregular action.—4. Most costly machine, little water supply, most expensive working, easy management, little danger, noisy irregular action.—5. Costly machine, no water required, cheap working, difficult management, little danger, noiseless action.—6. Less costly machine, no water required, least expensive working, easy management, little danger, silent action. This summary shows that the last system fulfills the conditions laid down in the most satisfactory manner, and the question, therefore, presents itself. Would not this system apply itself best for the purpose we have in view?

In addition to the forementioned evils, the systems 2 and 5, referring to driving by steam with a supply of steam, and to the use of compressed air, have the further disadvantage of not being able to be constantly working, for reasons that a considerable amount of time must necessarily be lost in replenishing them with the motive-power. This circumstance is, moreover, very important, since a greater number of machines will be required to maintain a constant communication, which naturally means a greater outlay of capital. Only a small amount of time need be lost for replenishing the water supplies with engines firing with gas; this disadvantage is further lessened with gas or petroleum engines, and disappears altogether with gas firing and heated air. This train of reasoning might, therefore, lead us to conclude that for large cities the best system of street-locomotive would rest with the application of gas and heated air. A further point which ought to be attended to in the construction of street-locomotives is the question whether they are intended for a prepared line, or whether they are to run in the open street. In the last instance, where the friction becomes greater, the weight of the locomotive ought to be reduced as much as possible. It is a well-known thing that our ordinary traction heavy engines have often failed for this reason on highways or uneven roads, consequently in such cases the more ponderous "caloric engine" would be entirely out of its place.

In conclusion, if the "caloric engines" have hitherto had no chance of superseding the locomotive of our railways, for reasons that we have not yet succeeded in obtaining many horse-powers from them without making them very cumbersome, still for such traffic as metropolitan passenger traffic where only a few horse-powers are required, the heated air engine may unquestionably claim our attention as being best adapted to the object in view—metropolitan communication.—*Partington, April* 13. CIVIL ENGINEER.

PRACTICAL MINING EDUCATION—ENGLISH AND FOREIGN MINERS.

SIR,—I have read your very temperate and lucid leader on this subject in last week's Journal over and over again, and whilst there are some points of which I cordially approve, there are others with which I cannot so readily agree. I am quite sure you do not entertain any prejudice against English miners, and if your article has done them an injustice they are probably as much to blame for it as anyone else. In the first place, I cannot admit the hard line you draw between technical and practical knowledge. You credit the English miners, on the authority of the late Sir Charles Lyell, "with having 'stumbled' upon a certain sort of practical skill," and to this also I take exception. Again, you say there is no use disguising it the Americans and Germans are going by us in the race, &c.; this also I do not admit.

In the first place I would ask, What is the technical knowledge essential to successful mining which we are said not to possess? And are we to understand that technical knowledge of the kind referred to can only be preceptively obtained? From numerous letters which have lately appeared in your valuable Journal the practical man has been persistently denied the possession of anything like a qualifying technical information. I only ask for justice at your hands—a fair field and no favour. I unhesitatingly admit that if we are deficient of technical information we lack the necessary qualifications to properly direct the operations in mining. But do we lack it? I deny that we do, and am willing to discuss this point in a fair and candid spirit with any proper person giving his name through the medium of the Journal, and also to examine the practical utility of some branches of technical knowledge which some of us may, but others do not, possess. It would be quite as rational, in my judgment, to set about learning the different trades at school as to become adepts in mining in the way proposed. In what light are we to regard mining, as a system or a theory merely? And is it intended that the proofs of practical experimentation are to be referred backward for endorsement and confirmation to hypothecated theories? "The theory of mining" in terms has been before your readers very frequently of late, but only in terms, and when we have asked for information as to what is intended in the terms we are favoured with no response, and still the accusation is repeated with additional and more weighty endorsement.

My second objection is to the form of expression used by the late eminent Sir Chas. Lyell—"That English miners have stumbled upon some sort of practical knowledge," the obvious inference of which is that even their practical knowledge must have been considered by him as inferior to that of others. If Sir Chas. Lyell were now alive I should unhesitatingly say he had stumbled on a fallacy. His contributions to geological science—it is to be presumed—will live through all coming time, but the expression you have quoted on his authority if immortalised will still be an error. If the prosecution of mining rested on an aggregation of theories unauthoratively adopted—I use these terms advisedly, as no one that I am aware of has taken upon himself to tell us what abstract theories may be safely adopted, and if not abstract they must be concrete, and as such associated with practice—the observance of the relation between the one and the other during the systematic pursuit of an object clearly outlined to the perceptive faculty within certain limitations ought, in my judgment, to be respected as something different to a stumble. Can the artizan be said to stumble with his art by serving an apprenticeship to the business and assiduously applying himself for years to learn its modes and principles, and rules, and why is he not told as the British practical miner is, no matter how expert and accomplished he may be as a practical operator, that he is still an incompetent workman, because he acquired his knowledge, not at school, but by a personal practical application to the business itself. I used to think in my unsophisticated days that theories were constructed as guides to practice, and have only recently discovered the necessity of referring consistent practical results, synthetically, to theoretic assumptions for their endorsement to obtain recognition and acceptance. The pilots who navigate the Mississippi river might as justly be accused of incompetency by operating on knowledge of an art acquired solely by practice and experience, and which science and the ordinary rules of navigation are unable to teach them, and they again others—as that miners should be rolled in the dirt for similarly acquiring a knowledge of their business which can only be learned, but never taught. There are many clever writers who delight to exercise a censorship over mining, but would it not be more to the purpose if

they were to devise and lay before us an intelligible code, accompanied by an affirmation that if adopted the alleged disasters of our present stumbling practices would be in great part, if not entirely, obviated. And how is it that the world is so slow to believe these specious pretenders, especially when it is repeatedly urged that the result of their practical endorsement would confer so much material and lasting benefit upon mining? The truth must be that they are still distrusted, and fail to evoke intelligent support.

My third and last position is that Americans and Germans are not superior to English miners—but, on the contrary, are not equal to them, and no one knows this better than Americans and Germans themselves. This may seem a bold statement, especially when I readily admit that German mining engineers have had a schoolastic education superior to our own. But then, again, I affirm that our practical education as much exceeds theirs as their schoolastic education exceeds ours, and can anything exceed unsurpassed ability to execute purposes. The difference between showy talk, ingenious pretence, and actual work is something considerable, and this may by-and-bye be found out at the Englishman's cost. If the journals of one country are invariably found praising their own, whilst those of the other as persistently depreciate theirs, the balance of praise must soon accumulate on one side, and the scale from such an accumulation of popular weight turn to the prejudice of the depreciated party. I ask no praise, but deprecate unmerited censure.

I shall indulge in no disparaging remarks on German and American mining engineers—they both do as well as they can. I have lived amongst them for many years in the United States, and fraternised with some of them, and always found my mining knowledge, whether technically or practically acquired, duly and properly respected, and done full justice to; but I protest againt English mining engineers being accounted inferior to the best of them. Our technical knowledge is persistently ignored, and it is not too much that I should ask for proof of this. I affirm that the assumption is untenable, but am open to correction if the contrary can be proved. If we are beat in the race of mining it will be because of adverse extraneous influences arbitrarily directed, embarrassing our course, impeding our progress, and conducing by illegitimate means to that undesirable end. If Englishmen are liberal enough and indiscreet enough to disparage themselves in the eyes of contending nationalities it is not to be expected that they will take any steps in opposition to their own interest to discourage our weakness; but of this you may feel assured, that they will not, under any circumstances, be found copying such an example.

I again say I ask no favour on behalf of Englishmen. Give us a fair field, and we can well afford to dispense with the favours; and if it should be replied, "Have you not had that?" my answer will be emphatically "No," and hold myself prepared to give abundant reasons for that conclusion.—*Llanwrst, April* 13. R. KNAPP.

LEAD MINING IN DERBYSHIRE.

SIR,—Lead mining in Derbyshire must, methinks, be deemed of a very unpromising nature, looking at the sluggishness in such mines as Great Rake, and Rushy Cliff and Success, both, I believe, some few miles from the town of Derby. The first appears to have had several thousand pounds spent on it (somewhere between 2000*l.* and 3000*l.* by recent adventurers), and the latter appears to have had many (over 10,000*l.*, I believe) thousands of pounds laid out with little or no result. It is never stated how much stuff, if any, whether caulk or other mineral, has ever been sold, or what price obtained (if any) therefor. In the case of the Great Rake, the weekly cost of (say) six men cannot be much (if so much) over 6*l.* a week, and they (*i.e.*, the directors) profess to have reached (they have been going to do so for some months past) a paying seam of caulk; some of this has, no doubt, been sold time back, but no quantity or price mentioned in their balance-sheet, and now there are rumours of difficulties in getting original shareholders to respond to calls of their own arrangement and making. It is certainly ill-calculated, Mr. Editor, to inspire any confidence in the minds of those disposed to venture if such questionable management is allowed to go on. Perhaps some of your readers who are acquainted with the district in question may be disposed to favour others with the benefit of their experience.—*April* 12. CAULK.

LEAD MINING IN THE COUNTY OF GLOUCESTER.

SIR,—In reply to "Excursionist," I beg to inform your readers that there is an old lead mine in the parish of Yate, which was worked about 150 years since; and that about three years ago I found within 18 in. of the surface as fine lead as ever came out of the far-famed Van. I employed the well-known Capt. Nancarrow, of the West Chiverton, who formed a very favourable opinion of the same. I shall be very happy to afford any party every facility for a trial, if they will apply personally or by letter to me on and after the 23rd inst. W. C. RANDOLPH.

Yate House, Chipping Sodbury, April 13.

HOW SOME COMPANIES ARE FORMED.

SIR,—In answer to an advertisement which appeared in your Journal of last week, in common with the daily papers, of a small colliery for sale, for the purchase of which and bringing into a profitable state 10,000*l.* was named, we have received a reply from an individual which is so suggestive of the way in which public companies may sometimes be brought forward that we herewith append a copy of it:—

"SIRS,—If you like to turn your colliery to a limited company you would get at least for it about 20,000*l.*. You could be managers, and receive a good salary. I could find you directors—four—myself, five; also a solicitor and banker; you would have to qualify the directors. I should require for all this about 500*l.*—part cash and some shares—and when I introduce you to the directors I shall expect about 25*l.* down."

We leave you and your readers to form their own opinion of the above. We suppress the name of the writer, although we believe it would be but rewarding the individual as he deserves to publish it.

Moorgate-street, E.C., April 14. HARVEY, JORDAN, AND CO.

THE CARIBOU SILVER MINES, COLORADO.

SIR,—In the Notices to Correspondents in the Journal of Feb. 27, "Pyrites" asks for information, and alludes to my report on this property made about a year ago. Ever desirous of keeping my countrymen posted on the mineral developments of Colorado—and they have never been so prosperous as at the present time—I wish to say, that although frequently in the neighbourhood of the mine, for the past four months I have not been underground in the Caribou, therefore what I may now say is derived from information given me by friends who reside in the village. Mr. M. A. Smith, the gentleman who purchased heavily in adjoining properties, upon being interrogated, made the following statement:—The deeper levels of the mine are turning out more ore than was ever produced heretofore; the past month's working, which closed on the 13th, gave a yield in bullion amounting to $31,130. The main shaft is now down about 100 feet below the tunnel level, with a course of ore in it over 4 feet wide. From what I can learn this runs about $150 per ton. I have seen several wagonloads of this ore passing by the place where I am now engaged in making some geological surveys; from its appearance I should not be inclined to value it, by "guess work," over $100 per ton. But suppose it to run only $80 per ton, it will then give a manipulating profit of very nearly cent. per cent. Last November I made a full report on the Nederland Reduction Works, showing the entire process from the crude ore to the refined bullion. I was in hopes the gentlemen at the Hague would have published it in the *Mining Journal*, for the benefit of all whom it may have concerned, but I am sorry to say such has not been done. I regret this very much, for I took great pains to make it a perfect exposition in detail. They have the very best works in the country. In the Caribou Tunnel a lode has been cut, called the Sherman, it is returning ore that runs from 200 to 1500 ozs. of silver per ton. The owners are in high glee, as a matter of course. At the east end of the Caribou is the caunter lode, called the "No Name;" they are opening up very rich ground, but as there is a local reduction works being erected they are not shipping any ore at the present time. The Seven-Thirty Mine, which is at the western end of the Caribou, has just been recommenced, and they are returning 150 oz. ore; altogether the Caribou district looks flourishing.

About a mile distant from Caribou a great enterprise has just been commenced, which will be known as the Buenaventura Tunnel Company. Should they succeed in putting this cross-cut through the 4000 ft. contemplated, it will intersect more than 20 lodes and veins, among which will be the celebrated Trojan, Newby, Sovereign People, and Arlington. There are extensive works going on at South Caribou. On Jenny Creek, about 3 miles distant, preparations are being made to open up several mines close up under the Snowy Range. Telluride mines of Gold Hill, in Boulder county, are reviving again; in fact, there is a general activity through the country.

Central City Colorado, March 25. CHAS. S. RICHARDSON, Mining Engineer, &c.

DON PEDRO MINE.

SIR,—I read in the Journal of last week a capital letter written by one of your correspondents on this mine, signed "Gold Quartz." His information is very full and clear, but I am able to add one or two items of information in favour of the mine's future, not brought forward in the same. One important point he has not mentioned—"that the costs of the mine are greatly reduced." The opinions of the mining captains are very favourable that Don Pedro is to be a coming success. Small-pox having raged has greatly interfered with the net returns of the mine, and prevented labour from being easily obtained, which is now at an end. That, in addition to the many favourable points in the mine mentioned by "Gold Quartz" in his letter, the 150 fathoms in the adit level is very fair in value, and that if the Canoa again improves, or the No. 6 makes richer when it forms the anticipated junction, larger returns must be made. Six English miners are now out on their way to the mine to follow out a course of explorations so earnestly suggested by the managers, and which are sure to lead to magnificent results. The continued rising value of St. John del Rey Mine, in the neighbourhood, ought to be looked upon with satisfaction. This mine has the advantage of a Stock Exchange quotation. The last increased returns from the same tend to strengthen the general opinion entertained that the adventure will ere long again assume its position on the market. I read with much interest the letter of last week.

SHAREHOLDER.

WHEAL CREBOR.

SIR,—The general meeting of last Thursday did not express clearly the prospects of Wheal Crebor. I see by the map the only level that approaches near to the boundary is the 72. The 48 east will take seven or eight years at least. This at present is paying well, and seems likely to be very valuable. The 84, 96, 108, and 120 are yet distant from the boundary. The western parts are comparatively unexplored. Mr. Martin, the chief agent of the Duke, bears the character of wishing to do all that is consistent with his duties for the tenants. Capt. Andrews, the mining captain, is one of the most intelligent and energetic in the district. SHAREHOLDER.

April 12.

WHEAL CREBOR MINE MEETING.

SIR,—I beg to call the attention of the Chairman to a remark made by him at the above meeting in reference to the 72 fm. level, east of the boundary. The Chairman said he was given to understand by me that there were from 40 to 50 fathoms to drive to the boundary, but that on the dialling of Capt. Andrews it was found to be only from 4 to 5 fathoms. The Chairman appears to me to have totally forgotten two or three very important facts:—The distance driven since the statement was made to him that I suspended the driving of this level before I left, and that Capt. Andrews has since recommenced the drivage. Also that I had repeatedly been to the mineral agent of the Duke of Bedford in reference to the extension of the sett eastwards on the course of the lode. JOHN GOLDSWORTHY.

Crebor, Tavistock, April 14.

TYLLWYD MINE.

SIR,—"C. E. W." says he should like to know what I consider "a fine bunch of ore," quoting the expression as if I had used it. The quotation is not from my letter, and further confirms me that he does not understand what he is writing about; he seems to have got into a muddle, and it is no part of my duty to get him out of it. Possibly if he had not got puzzled he might have perceived that to erect a 40-ft. wheel, crushing and dressing machinery, and lay open stoping ground for about 900 tons of ore, was not at all bad work for two years. Very few mines can show such good progress. As monthly sales of ore will commence, according to Capt. Paull's reports, next month, it will be more satisfactory for the shareholders of this company to wait until they take place than to learn what I think the regular monthly sales will amount to. One thing I can say, Capt. Paull has been requested to begin with small sales, and gradually to increase them rather than with large sales, which may not be kept up, so that "C. E. W.'s" doubt that "dividends will anticipate a demand for fresh capital" is not likely to be realised. I can only say that the ore in the winze has not been unbottomed, and that Capt. Paull, in his report of March 24, states—

"The winze at the mouth of the level and rise in back of the 20 were communicated all right on Thursday night last; this has well ventilated this part of the mine, and has laid open a large section of stoping ground, which can be taken away to great advantage; and from the calculation of ore we have driven through in this level, we have now 400 tons in this place, which can be stoped at about 3*l.* per fm. (each fathom yielding 1 ton of ore), including the clearing of stuff, which will yield a good profit. I am happy to say that the same level which is now being driven on again west of winze never looked better than at the present moment. The lode is 3 ft. 6 in. wide, containing spar, clay-slate, and lead ore, yielding fully 1 ton 2 cwts. per fathom of the latter, and very likely for further improvement."

If this is not satisfactory information for "C. E. W.," I am sure it must be for the shareholders. "C. E. W." having made such a very free use of my name in his letter, perhaps he will have no objection to disclose his own name, and should he prove to be a shareholder I shall apologise for treating him as one desirous of alarming shareholders with the view of inducing them to part with their shares at his own price. I have been led into this correspondence with an anonymous writer solely in the interests of the shareholders, in order that the motives of the writer might be made obvious to them; and having now accomplished what I designed, I shall neither refer to his personalities, which fall harmless from an anonymous writer, nor take further notice of his letters unless he gives his name, so that we may see the nature of his interest in the company.

April 14. D. FORREST, Secretary.

TYLLWYD MINING COMPANY.

SIR,—In my report of March 18 I began by saying "the 20 fm. level has been extended 4 fms. in a lode fully 3 ft. wide, containing spar, clay-slate, carbonate of lime, and yielding 1 ton of lead ore per fathom, which is the value of the present end. On Saturday last we put the men to rise against the winze; they are now up from 4 to 5 ft., and we shall hole in a few days." Surely this level must have passed under the winze, and if so it yielded its ton per fathom there the same as it did in the other 3 fms., which was the value of the winze above. The rise was then up 4 or 5 ft. on the south side of the lode in the clay-slate. As the air was bad in the winze we wanted to hole as soon as possible, which we did in a day or two, as I said. I did not think it necessary to set any value on the rise, as the level below and the winze above were of the same value, and only 6 or 7 ft. between these two points, which any miner would understand. Now, I do not think "C. E. W." can be a miner; if he is, he surely would not have made the enquiry he has, seeing that we had put up a rise 4 or 5 ft. in the back of a level that yielded 1 ton of lead ore per fathom. I may also say that being full of orestuff the lode is still standing on the north side of the rise fully 3 ft. wide, and worth 1 ton of ore per fathom, which can be seen by "C. E. W." or anyone else. And I may further remark that the lode in bottom of level is quite as good as any of the said 4 fms. driven during the month, and for my part I fail to see any signs of unbottoming the ore, and if any difference it is better in the bottom of the level, consequently we are now preparing to sink the engine-shaft another 10 fms. in order to get under the ore driven through in this level, which is a practical sign that the ore is not unbottomed. If "C. E. W." is interested, or otherwise, in this mine, he will no doubt have seen by the reports that we have already 400 tons of ore laid open over this level, and I have not the slightest inclination to alter my opinion. We have also driven on south-west lode 20 fathoms long and about 30 fms. high, which will produce on an average over 1 ton of ore per fathom. Here we only calculated 500 tons instead of 600 tons, without taking into consideration the ore gone down in bottom of this and also the 20 fm. level. With regard to the mountain "C. E. W." speaks of, I am pleased to see it so large, and from present appearance I think it will be a long time before "C. E. W." will see it diminished to a tiny mole hill. If "C. E. W." would take the trouble to come on the spot (which would not be far for him to walk) he would be a much wiser man than he now appears to be. I have no doubt he has good reasons for not putting his proper name to his letters. If "C. E. W." will in any further correspondence attach his real name, I shall be glad to give him any further information in my power consistent with my position with the Tyllwyd Mining Company. I am perfectly at a loss to know why "C. E. W." should interfere with anything belonging to the Tyllwyd Mining Company, he not being a shareholders. Possibly it may be an eye-sore to him, seeing the mine is turning out so well.

April 14. JOHN PAULL, Manager.

TYLLWYD MINE.

SIR,—Seeing a long letter from "C. E. W." in last week's Journal relative to the above property, I think it is but fair to say that the reports which have eminated from Capt. John Paul are scrupulously correct, and if they have erred it is in keeping on the right side, or estimating the produce lower than the real yield of the lead ore. Had "C. E. W." seen the ore at surface, and broken from the different bargains reported on, I am convinced he would not dispute the fact, and I cannot but think that writing in such a dubious manner about the mine seems to betray that what he has expressed is "father to the wish," but whether this is so or not the returns will be made so quickly that facts must speak for themselves.

We are often pestered by shareholders for not giving enough information, but "C. E. W." seems to think rather too much information has been given in this case. Well, such is life. I am reminded forcibly of the tale of the old man and his ass, who by endeavouring to please everybody pleased nobody, and lost his ass in the bargain. I do not suppose Capt. Paul will pay much attention to anonymous epistles, as they are generally written for a certain purpose, and that purpose frequently best known to the writers of them.

Again, if it were the intention of the company to go on with the erection of machinery before laying open ore ground to supply it, I grant "C. E. W." that time enough has elapsed for that purpose, but they have adopted a much wiser course, and they have caught their hare before they attempt to cook it. A thousand tons of ore to have laid open in a young mine to commence with is a really respectable quantity, but by no means too much to insure regular returns and profits, and the system of erecting machinery before the finding of sufficient ore to warrant it is a great curse to mining, and leads to the abandonment of half of the mines which would otherwise pull through had the money been expended in making trials underground. We often see mines return 20, 25, or 30 tons a month for some two, four, or six months as the case may be, and then stand still for two years before making another sale. The eating the calf in the cow's belly is bad policy in mining as in every other business, and the only way to ensure a lasting and a permanently profitable mine is by laying it out as this mine has been laid open and managed. I have no interest in the mine as a shareholder, and simply write this in order that the shareholders shall not be misguided by statements put forward to damage the mine. I fully believe that all that has been said concerning it will be verified.—*Gogmau, April* 13. ABSALOM FRANCIS.

PRINCE OF WALES MINE.

SIR,—The periodical meeting of this company last week was not at all a satisfactory one. The work of six months has been conducted at an average loss of 200*l.* per month, after allowing credit for the value of all the ores brought to surface. This enormous expenditure appears to have arisen with a very small establishment, but it has left the mine worse than at the commencement, and with really little prospect before it but a continuation of the like experience of loss in the future as the past. The committee of management in its wisdom has abandoned the deeper levels of the mine, because there was a difficulty, in all probability, as to raising the cost of a new engine. What it ought to have done in the outset was to put plainly before the adventurers that by having this necessary machinery they might prosecute their labours with some hope of reward, whilst without it there could hardly be anything else in store but repeated disappointments and continual calls. Some years ago there was a spasmodic excitement about the wealth of silver in the mine. The committee spent a great deal of money, and, no doubt, with good excuse, though not with the sanction of their agents and experts. Then came the next spasm about tin. The same course was pursued on that occasion. A large expenditure was made for which there has been no adequate return. Now then, another little movement. The supposed fertility of the mine ready to respond to all demands is going to improve the situation of the adventurers by its yield of arsenic. It is to be feared the result will be no better than before. The committee knows nothing about the business—the captain very little more. There is a hope that arsenical mundic can be raised at a cost of 1*l.* per ton or less, but as to what the selling value of the product is there is no information. It is expected, however, that a business will be initiated which will reduce the present monthly loss from about 200*l.* per month to 100*l.* Is this object all that is to be gained? Cannot the committee propose something better than to continue the mine under such conditions, and wait upon Providence for something to turn up? If nothing better can be done, indeed had they not better resign, or wind up? For the only end of such a policy must be exhaustion of the shareholders, disgust, and liquidation. The very use of a committee in such cases is to stand by the mine, and say what should be done; not to be blown by the whims and fancies of changing adventurers to this and that point of the compass, but to have a policy, and stand by it, or resign. At present, the committee would honour itself and greatly advance the interests of the mine if it would call for money to buy an engine, which should cost not more than 600*l.*, and also to carry on the mine on the most economical footing by paying cash for coals and timber and other supplies. The costs might in this way be reduced to an extent perhaps little anticipated by the shareholders.

COPPER.

SOUTH FRANCES MINE MEETINGS AND REPORTS.

SIR,—Some months ago you kindly inserted a letter of mine, in which I attempted to show that the accusations against me contained in the remarks issued with the report of the meeting held in November, 1874, were untrue. I also called attention to the extreme absurdity of the remarks, but this I only partially accomplished, intending ere this to review at greater length the whole matter; the lack of leasure time, and an aversion to agitate a question which the more it is stirred the worse it will be, has again and again caused me to hesitate, but, seeing that in the last meeting report the agents actually recommend the suspension of such operations as I suggested would be to the pecuniary advantage of the mine if they were suspended, I feel that I am justified in again alluding to the subject. I have sent herewith the remarks in type; should any person question the accuracy of my quotations I should esteem it a great favour if you would insert them *in extenso*. For the purpose of reference I have numbered the paragraphs which I think are more particularly deserving of notice.

In paragraph No. 3 it is thus stated—"During the past two years, in consequence of the general repairs and improvements made both in pitwork and machinery, and the extra labour whilst preparing and putting in the flat-rods, our smiths have eaten no idle bread, and instead of working the usual 10 hours they have been compelled to work 15 hours—sometimes 20 hours—for the same pay, and, we are proud to say, without grumbling." What meritorious smiths! what rare examples of passive obedience these men must be! The village blacksmith immortalised by Longfellow is a pigmy in industrial virtues compared with these. But, looking at the declaration in the light of common sense and justice, does it not impress the reader that the production of such evidence of efficient management only tends to manifest a spirit of over-reaching cupidity, which is blind to legal and equitable compensation; to tax the strength and strain the energies of workmen to the utmost limit of endurance and capability, and pay them by a mere barren and wordy acknowledgment, is a false and parsimonious economy; moreover, it is suggestive of an obtusity of intellect in the employed which ill agrees with their paraded and exemplary skill, and an inexcusable insensibility to fairness in the employers; and is it not a very remarkable coincidence that in such continued and unavoidable emergencies as were experienced for two years men could be found to labour excessively without fee or reward? The next paragraph will remove the ambiguity surrounding this unusual circumstance; it will show that this dignified forbearance—this unsurpassed disiuteresetedness—had its source and centre in the agents, and from them gradually but effectually permeated not only the smiths, but the whole of the employees. I assume this, for although reference to such a state is withheld from the extreme modesty of the writers, yet it is a fair conclusion to suppose that their example inflenced all who were in their employ. I will, however, no longer make allusions or suppositions, but will proceed to quote the statements upon which I base my assumption.

The next point touched on is "excessive agency." "And here we may remark that for the first 12 months we each spent not less than 72 hours per week in the service of the mine." I shall not attempt to disprove this assertion, but it certainly bears an appearance of improbability, and I can imagine the shrugging of shoulders, the significant nudges, the incredulous smiles, and the many insinuating glances that will follow the perusal of this statement by those who intimately know the writers; but such intense application is beyond human endurance, and I fancy, by way of respite, one at least of the parties concerned has found time to inspect mines, and give unfavourable reports upon property which has since become productive. If I mistake not, he has even found time to visit an adjoining mine, and render himself disagreeable; and I dare say has found time to pay frequent visits to a very funny sharebroker, who is no *Ride* for anybody. Let me quote again—"We have hitherto considered no labour too much, no difficulties too great to be surmounted, for the benefit of the mine; we have laboured with zeal and energy, and entered into the facts and figures of the glaring and iniquitous encroachment with which we have had to contend with a will and purpose that could not be excelled by us." The foregoing humble estimate requires no commendation from me, but I will pass on to notice sentences wherein confusion and contradiction outvie each other—"Plans and sections have been made upon the most considerate basis to illustrate the objects we had in view," &c. Now, what is meant to be conveyed by the term considerate basis I do not clearly understand, for, as I take it, the only trustworthy or accurate basis that could be used for the purposes of illustration or guidance would be correct dialling; any other foundation from which to draw a conclusion or form an opinion would be the most delusive and inconsiderate basis, and the most fallacious premises, and yet, as the matter is stated, there is an intimation that some other mode was adopted to direct their operations. If, therefore, they have substituted imaginary data for facts that could be scientifically proven and established, I can conceive that no amount of extra supervision would relieve them from an ever-present apprehension of uncertainly about the intersection of the West Basset lode; and I can also conceive that disorder, irregularity, and dissatisfaction would distinguish their labour, as well as characterise their writing. I will cite once more—"We have sampled 191 tons of tin, and sold 216 tons, during the past two years, giving a surplus of 25 tons of tin, equal to about one-eighth more sold than was sampled, which clearly indicates that your agents have not allowed the produce of the mine to wash into the Red or any other river."

The result to which the writers point with so much self-congratulation is a delusion and a fallacy, and I am surprised that they beguiled themselves to believe that such an inaccurate conclusion would win acceptance or admiration from the shareholders. The dressing of any parcel of mineral is generally conducted in accordance with the value, which is ascertained by preliminary testing, observa-

tion, or judgment; and the whole of the subsequent manipulations are directed to secure uniformity of result. With the preliminary assay of sampling, where judgment or observation is replied upon for guidance, discrepancy may be expected, and partially excused; but when the precautionary and surer method of sampling is adopted there is no ground for acquital of blame. Now, in the case before us, I submit the result is extremely unsatisfactory, even though the product exceeds the sampling, and for these reasons:—If the dressing of the ore were conducted on the principle before alluded to the production of such an excess of value suggests the possibility of a still more valuable product being derived by a more correct method of treatment. It is quite evident that the agents were ignorant of the actual value of the ore, for they allude to the unexpected excess with pride. And it is equally plain that they dressed according to sample obtained; but the sampling was incorrect, for 191 tons yielded 216 tons. The productiveness is, therefore, clearly not attributable to their superior skill or intelligence; if it were, it was exceedingly unwise on their part to mention the sampling at all. The result of the two operations is so dissimilar that I am fairly entitled to assume that both were imperfectly performed, and, in consequence, have good reason to suspect that tin was lost. In short, my argument stands thus: the sampling was incorrect, the dressing imperfect, and the product unsatisfactory. Into whose hands the surplus tin fell it is not for me to say. On Dartmoor the geese are accused of tin stealing; but in the West it falls most probably to the share of those unwinged bipeds who frequent the Red River, and who, despite all assertions of care and scrutiny, manage to live, thrive, and fatten upon the slime and offal of mines.

But, putting aside my arguments as unsound and delusive, and imputing to the writers all the skill they claim, admitting even that they might recount at greater length their unrecognised merits, as an extenuation of their high aims or aspirations, I ask myself the question, What has been achieved by such unremitting attention, assiduous application, and unsurpassed supervision? What is the outcome of this prodigality of effort? The recent report reveals more faithfully and simply than I could expect the sad termination of a protracted struggle. It appeals to our sympathy for those who, four months ago, were secure in their own estimation from the mishap of adversity, defeat, and humiliation. I contemplate with revulsion of feeling the prospect which looms in the future for these industrious agents, a future of distasteful repose and repugnant indolence. I see them listless and enervated, supinely lounging in the account-house, growing fat and useless. I imagine their wistful looks at the spots which until lately were the scenes of cheerful toil, with a stern and unrelieved gloom upon their faces; and with bitter remorse gnawing at their heart-strings they will be continually reminded of their impoverished condition by the melancholy groaning of ungreased machinery; while the illustrious smiths forsooth, true to their passive natures, with soot-begrimed countenances will sit upon their anvils in stoical indifference, until their muscles become flabby and unelastic. But the report says more than this; it shows most distinctly that the opinion I ventured to express 16 weeks ago with regard to the suspension of stopes and pitches, and for which I received unmerited reproach, is the very course of action the agents propose to adopt, and which, had they adopted it at the time of my recommendation, would have saved a useless and large expenditure of money. It shows also that my opinion respecting the improbability of quickly cutting the great misnamed flat lode is correct; this forlorn hope of the shareholders is again deferred, and this capricious mineral vein has become the alluring bugbear which eludes the search and subtle pervision of those who a short time ago blazoned their prowess to procure my discomfiture; somewhere provokingly near, it lies embedded in the dark recesses of the earth, and if in their disappointment they can sing at all, what song would be more appropriate than, "Thou art so near, and yet so far."

It is an unpleasing task to record your own refutation and chagrin; it is a disagreeable and debasing ordeal when men are compelled to scourge themselves, to confirm what they have denied, to act upon advice they scorned and spurned; it is a degrading abasement, and I do not rejoice at the circumstances which oblige even my opponents to do it. In the interests of mining I would that it were otherwise; but this much I will say, that it is a feeble indication of ability when a little pecuniary success goads men to ridicule and censure those who may differ from them in opinion. Human judgment at best is very imperfect, but but when this imperfection is united to ignorance, arrogance, and pride it is utterly valueless and unacceptable. I purposed introducing some information which would be far from complimentary to the persons alluded to, but I have already taken up more space than the merit of my letter deserves; I will, therefore, forbear, and will rest satisfied with the public refutation of their own errors, which the recent report of the writers so unmistakably avows. I cherish the hope that the imposed solitude and inactivity which the agents must experience will foster in them a juster estimate of their inability, and prevent them from again attempting to win the esteem of their heavily taxed proprietary until they have earned it by the performance of some deed more praiseworthy than the composition of confused, contradictory, and egotistical remarks.—*South Ward Mine, April* 13. R. GOLDSWORTHY.

[For remainder of Original Correspondence, see to-day's Journal.]

Meetings of Public Companies.

GREAT LAXEY MINING COMPANY.

The half-yearly general meeting of shareholders was held at the London Tavern, on Wednesday,—Mr. G. W. DUMBELL in the chair.

The notice convening the meeting having been read, the report of the managers and half-yearly accounts (which appeared in last week's Journal) were taken as read.

The following supplemental reports were read:

The directors have much pleasure in meeting the shareholders on this occasion, under a feeling that a full and fair examination of the balance-sheet must prove satisfactory to every shareholder in the company. The accounts show that with a considerable increase of ore raised the costs have been largely reduced, and while the dividends paid last half-year have been twice as much as the previous half-year, the actual balance to credit is more than double that of either of the two previous half-years. The toppings, so long increasing to the cost of the company, and an annoyance to the directors, are now being dressed as they arise, and the accumulations are being gradually reduced. The new machinery provided for this purpose is a great success. Since the meeting in October last the managers have been permitted to work the mine in peace, and the result speaks for itself. The men have become contented and submissive to order: they are working well and with good will, and earning good wages, and the pay-sheet is the best proof of the thorough knowledge of the managers in arranging the prices to be paid for working the ground. By the company's Deed of Association it is provided that the directors may from time to time out of the profits of the company set aside such sum as they think proper to form a reserve fund for the purpose of meeting any extra cost at the mines and to assist in equalising dividends. The directors have, therefore, resolved to adopt this course, and have set aside the sum of 2000*l.* to be carried to a separate account for that purpose, and the directors believe that the possession of such a fund will tend greatly to enhance the value of shares in the company, as it will give a prospect of regular quarterly dividends being paid, which cannot otherwise exist. There appears to be rather a general feeling that it would be well for the company to dispose of that part of their sett called Glenroy, and the directors are inclined to take the same view of the matter. A resolution will be submitted to the meeting upon that point, and which, if carried, will authorise the directors to dispose of Glenroy as they may deem best. A question has been several times raised by many of the shareholders as to the propriety of the directors being paid for their services, and at the meeting in October last the consideration of the matter was postponed until this meeting. The directors can only say that it is for the shareholders to decide whether they are to be remunerated for their services, and if so to what extent. The directors yesterday declared a dividend of 6*s.* per share, payable in 14 days. The directors will lay before the meeting a supplemental report in reference to a proposed railway to Laxey.

SUPPLEMENTAL REPORT.

The directors have already made their report to the shareholders of the general affairs of the company, but they are anxious to lay before the general meeting this day a matter which the directors consider of very great importance to the company. Notwithstanding the establishment of the Laxey Steamship Company, which has greatly facilitated the delivery of the ores, there are still great difficulties to contend with by reason of the exposure of Laxey Harbour to heavy inshore gales. A few individuals have lately started the idea of a line of a railway from Douglas to Laxey, and thence to Ramsey, there being no line of rail to the north or east of the line that extends from Douglas to Peel. In pursuance of the idea of the proposed new line, the ground has been surveyed by competent persons, and a line marked out, with an approximate estimate of the cost, one special object in view being to arrange the line in such a course as would enable the Great Laxey Mining Company to deliver all their ores into vessels in Douglas Harbour, and to obtain all their supplies from Douglas upon the same line. There can be no doubt whatever that such an arrangement would so facilitate the regular and speedy delivery of the Laxey ores as to raise the price of such ores to a considerable extent, it being found so difficult to regulate the delivery, even by steamers, that persons are often deterred from purchasing, and the mining company suffers great loss. The Isle of Man Railway Company have been invited to carry out the proposed scheme, but have not yet consented to do so, and in case of their final refusal an attempt will be made to form an independent company to establish the proposed line. The directors have thought it advisable to bring this matter prominently before the shareholders of the Great Laxey Mining Company, in the hope that many may feel disposed to join in taking shares in whatever company may be formed to build the line of railway referred to. No doubt the benefit to Great Laxey will be very considerable, and there can scarcely be any doubt that, as a speculation, the new railway would prove very successful.

The CHAIRMAN said the shareholders had been told by the reports of the very satisfactory state of the company's affairs; without taking into consideration the value of the "toppings," the accounts showed a balance of 13,159*l.* of *bona fide* assets belonging to the company, which was far in excess of anything of the kind they had had for a considerable time. It was well the shareholders should be aware of some facts connected with an impression made in the minds of many that the managers—under, of course, the control of the directors—had unwisely proceeded in discharging a number of the hands. About eight months since some 100 hands were dismissed, and parties led the shareholders generally to suppose that the mine was, consequently, going to ruin, the best proof of which was that there was not enough work for the men employed; in fact, that the mine was being worked out without prospect of success to the shareholders. It must be a satisfactory result that with all this reduction of men more work had been done, and more money made, by the company. They had reduced their expenditure upon the last six months by 523*l.*—an actual reduction of expenditure upon the last six months as compared with the preceding half-year. Out of that sum 329*l.* was a reduction in the actual wages, therefore it must be admitted, he thought, that there was judgment and ability on the part of the managers, and also knowledge of the ground and the proper price to pay for working it, and, moreover, that the result had been most satisfactory. He knew individually it was a most painful thing—deputation after deputation of these discharged men came to him, and it was a very unpleasant thing to hear their tales, and to be totally unable to interfere in their behalf. If he, as Chairman, or the directors as a body, stated that these men must be put to work, if the mine was managed only to gratify their own personal feeling, the shareholders would suffer unquestionably, and the managers would feel that in future they must not attempt to lessen expenses. His own opinion always had been—and 40 years had elapsed since he first became a director of the company—that there should be no attempt to coerce the managers, unless there was some grievous defect in the management. The managers had never taken any important step of this kind without informing the directors, and giving the reasons, and unless the directors were better miners than the managers they would never attempt to prevent any proposed change being carried out. The directors in their report had told the shareholders the result of the raisings. In the month of February, 1874, the accounts showed that the costs for the previous half-year was 26,327*l.*; for the half-year ending August, 1874, it had been reduced to 24,773*l.*; and for the half-year ending February, 1875, it had been further reduced to 21,088*l.*—that had arisen from the manner in which Capt. Cornish, the present manager, assisted by Capt. Reddicliffe, had carried out the economic working of the mine, and, at the same time, increase the profits to the company. In February, 1874, the balance was 5736*l.*; in August, 1874, 5276*l.*; and in February, 1875, 13,159*l.* The dividend paid for the half-year ending February, 1874, was 7500*l.*; for August, 4500*l.*; and for ending February, 1875, 9000*l.* It was easy for any of them to talk, but those figures—which he pledged himself had been taken from the accounts—could not be overcome, but overcame all argument that could be used as to the legitimate working of the mine, and the manner it had acted on the men and the men upon the work, resulting in an increased profit to the company. Supposing they had yielded to the pressure brought to bear, and removed the managers—if they had dismissed them under such charges their bread would be gone, and they ruined men—the directors had the courage to resist the pressure, and say "We don't believe what you say, and we won't discharge the managers," and he was most thankful they had not taken such a course, but at once said—blame the directors as they might previously to Capt. Cornish having been appointed manager, they had had frequently bargains let to men who earned from 5*l.* to 6*l.* per week; they complained of it, but could get no redress except by a change of management, and they were told that by attempting to do so the men would strike. The men had struck before, and a greater blessing never occurred to the Great Laxey Mine than the way in which that strike had been met—if they had yielded to the pressure then brought to bear they might have given up all hopes of ever getting another dividend out of the mine. The average wages paid to the men were most satisfactory—in January it was 1*l.* 7*s.* 8*d.* per week; in February, 1*l.* 5*s.* 6*d.*; in March, 1*l.* 6*s.* 1*d.*; and in April, 1*l.* 5*s.* 1*d.*; and he challenged any mining company throughout the kingdom to show by their books a more complete refutation of the charges brought against those managers; he defied them to go on showing such regular earnings without being men of judgment and ability, and without fully understanding the value of the ground explored. He had every month a short note showing the highest and lowest wages, and also the average, and anything more satisfactory, to his mind, could not possibly be. The next thing to which he wished to call attention was the course adopted by the directors—and for which he blamed himself as much as anyone—of yielding to a continued pressure to divide as much of the profits as possible. By the Deed of Association it had been provided that the directors might, when they thought proper, set apart a portion of the profits to form a reserve fund, to enable them to equalise dividends, and provide for special outlays. It had been a sort of custom to pay as large a dividend as possible, and letting the future provide for itself—the consequence had been irregularity in the amount of dividends, which had been very offensive to many shareholders. There was no means of providing for any large exceptional expenditure that might arise; but the Deed provides that they may "before recommending any dividend set aside out of the profits such a sum as a reserve fund to meet contingencies, and for equalising dividends, or for repairs, or maintaining the work connected with the business of the company." Pursuant to this power, the directors have set aside a sum of 2000*l.* as a beginning towards a reserve fund. This reserve fund will have the effect of raising the value of the shares to a certain fixed price almost, and, consequently, his friends who are speculators will not be pleased that this step had been taken, because when large dividends had been declared those entering into such speculations pointed out merely the high-rate dividend, but, probably, did not tell the purchaser what dividends were likely to be paid hereafter. A question had arisen between the directors as to the amount of dividends to be declared to-day—that question was very fully discussed, and it was decided to adhere to a 6*s.* dividend, and to give 2000*l.* towards a reserve fund rather than declare a larger dividend, and set aside less to the reserve fund. (Hear, hear.) They could always, if they had the means, increase the dividends; and it was far better to do that than increase the dividend now and decrease it next time. The limit of the reserve fund had not been determined, because it was impossible to say how soon that fund might be called upon for machinery and repairs; they would be guided by circumstances, and the shareholders could always control the amount when it was proposed to set aside too large a sum. There was a question referred to in the report as to the advisability of disposing of that portion of the company's sett called Glen Roy. The manager thought that sett could be better worked by an independent company than by the Great Laxey Company, besides which, it would be a great relief to the present company if they could sell that portion of the sett, realising whatever was thought best for it, and let some other company vigorously develope it.

At present the expense was a dead outlay, and did not yield any return, but the day might arrive when it might be a success. If the meeting was of opinion that course should be adopted he was prepared with a resolution authorising the directoss to take the necessary steps, and to sell Glen Roy upon the best terms obtainable; they would have to apply to the Office of Woods and Foreats to obtain the consent of the Commissioners. He might add that the lode in Glenroy was a separate one to that in Great Laxey, and, therefore, it was impossible it could interfere in any way with the working or returns from Great Laxey proper. It had been mooted time after time as to whether the directors ought to be paid for their services; hitherto they had not been paid; perhaps, he confessed, he had been foolish, but it had been a sort of pride on his part to throw cold water upon it. As, however, they got older they got more sensible, or ought to do. If the shareholders chose to say the directors should be paid, it was for the meeting to determine the amount. He then moved that the reports and balance-sheet be received and adopted.——Mr. LAMBERT seconded the proposition.

The CHAIRMAN, in reply to questions, said that the proposed railway, referred to in the report of the directors, would be an independent company, but they wanted the shareholders in the Great Laxey Company—if they saw a probable success—to unite in carrying out the scheme. According to the Deed the Great Laxey could not construct the railway. If they had the power he should be the first to propose to carry the line to Great Laxey.

Mr. LAMBERT noticed that at the date of the accounts the stock in hand was valued at 12,680*l.* Since that date a considerable part had, no doubt, been sold, or, perhaps, the whole.

The CHAIRMAN said that the ore sold since, including lead and blende, amounted to 16,855*l.*, and more had been raised.

Mr. LAMBERT did not wish to take any illiberal part in the question of the directors' remuneration, but he should feel much more satisfied to see the management of the mine under the direction of those who held a large interest in the company than that they should be paid.

Mr. H. BELL expressed satisfaction at the formation of a reserve fund, and considered it a most scandalous thing that a large mine like this should be without a reserve fund to meet any emergency that might arise. He considered the directors should be paid for their services, but it would have been more satisfactory if they had submitted a proposal as to the amount to which they thought themselves entitled. As to Glenroy, he thought notice should have been given, pursuant to the Articles of Association, although he had no desire to place any obstruction in the way of the directors. He thought notice should have been given of this proposition as well as that referring to the payment of directors.

The CHAIRMAN thought there was a great deal in what Mr. Bell had said with regard to notice, but the rules of the company did not preclude the question as to the payment of directors, because it was no alteration of the Deed or deviation from it, because it said they should "not apply any part of the funds unless for the operations of the company." If there was any meaning in paying directors, it was for the carrying on the operations of the company. At the last meeting it was specially stated that the question should be settled at this meeting.

The motion adopting the reports and accounts was put and carried unanimously

Upon the proposition of Mr. LAMBERT, seconded by Mr. BELL, it was unanimously resolved that the remuneration to the directors be voted at the next meeting, such remuneration to commence from the last election, in October.

A SHAREHOLDER most cordially supported that resolution, for the directors had given a great deal of time and taken a considerable amount of trouble in promoting the best interests of the shareholders, and he, for one, was most unwilling to ask them to work for him for nothing.

The CHAIRMAN, referring to Glen Roy, said the managers believed it was best to sell it; the directors had put their value upon it, but he did not think it advisable to communicate the sum. He need hardly say they would endeavour to get as much as possible.

Mr. LAMBERT was strongly of opinion that the whole matter should be left in the hands of the board.

It was then unanimously resolved—"That in the opinion of this meeting it is desirable to dispose of Glenroy, and the directors are, therefore, authorised to sell or dispose of it upon such terms as they may think best, taking care to define the boundary line."

The CHAIRMAN mentioned that the cost at Glenroy had been about 30*l.* per month.

A vote of thanks was passed to the Chairman, directors, and managers.

The CHAIRMAN, in acknowledgement, thanked the shareholders for their renewed mark of confidence; such confidence assisted them materially in successfully working the mine, because the men were sharp enough to find that out.

The meeting then separated.

NORTH LAXEY MINING COMPANY.

A general meeting of shareholders was held at the offices, Austinfriars, on Tuesday,—Mr. W. C. BULLER in the chair.

The notice convening the meeting was read. The report of the directors was read, as follows:—

1.—Your directors would refer you to the report of Capt. Rowe for the work done at the mine, and its present position and prospects, which may be considered satisfactory.

2.—It will be seen by the balance-sheet that this company has sold 165 tons of lead ore for 2503*l.*, to which may be added 50 tons sold to-day for 740*l.*

3.—In July last your directors intimated by a circular that a negociation was then in progress with a view to get the whole of the unissued shares taken up, but they regret to say it fell through. Since then the prospects of the mine appear from Capt. Rowe's reports to have still further improved, particularly in the deeper levels, and your directors are anxious to be in a position to sink the north shaft deeper forthwith, a step which Capt. Rowe says should not be further delayed. The present available funds would not justify this to be commenced, and your directors, therefore, propose to receive subscriptions for not less than 600 of the unissued shares, which would provide 1200*l.*, a considerable portion of which your directors are prepared to subscribe, provided the whole is made up. The shareholders may be reminded that for each of these shares a bonus of two fully paid-up shares of 2*l.* each are allowed, so that for each 2*l.* paid a subscriber obtains three shares of 2*l.* each. To facilitate the matter it is proposed to make the amount payable quarterly in instalments of 10*s.* each, after payment of 10*s.* on application.

4.—The number of shares at present issued or appropriated is 11,714, leaving 4428 shares of 2*l.* each to be issued for cash, and 8856 bonus shares to be rateably allotted with them as above.

5.—The accounts have been audited by Messrs. Brandt, Stansfield, and Co., and it will be necessary to appoint an auditor or auditors at this meeting, and fix their remuneration for the ensuing year.

The agent's report was read, as follows:—

April 10.—Since my general report of June 29 last the prospects of the mine have been of a variable character; the result so far of the operations at the 60 south has proved disappointing, while the north ground, from the bottom level upwards, has decidedly improved. In driving the 60 south, since last July the appearances for ore have much fallen off, the lode has been disordered, and split into several parts, and the rock become of a very uncongenial nature, so that I have suspended the driving; this level is now driven south of south shaft 135 fms. altogether. At the north shaft the 121 south was only last month resumed, the chief object hitherto being to prove the north ground at this depth; the end is now in course of driving, and the lode in it is about 1½ ft. wide, containing a mixture of lead throughout, and has all to come to the washing-floors. The 121 is driven north of shaft altogether 35 fms.; the lode in the end at present is 1½ ft. wide, and worth 1 ton of lead per fathom; in this driving we have already opened out about 8 fathoms of ore-bearing ground, with every prospect that we are verging on richer ground ahead, and which, for several reasons, I have confidence will turn out to be of a more lasting nature than anything we have yet seen in the mine. The 110 has been driven north since June 12½ fms., of which 5 fms. were in ore ground; the lode in the end is at present unproductive, and the driving for the time suspended, mainly for the purpose of facilitating the sinking of a winze from the 110 to the 121; in this winze the lode is worth 2 tons of lead per fathom, and when sunk through will open out a valuable piece of new ore ground for stopes. The total length of ore ground opened out in the 110 is about 25 fms. The next driving has been the 84 north, now the most advanced level in that direction; our object here has been to discover additional runs of ore ground if possible, and we have certainly passed over the top of the last ore ground discovered in the 110, but it is by no means so good as in the latter level. The lode in the present end is about 1 ft. wide, and I am pleased to say much improved within the last few days, now worth from 5 cwts. to ½ ton of ore per fathom, with a good appearance of further improvement. Finding the stopes in the roof of the 60 extending in length, we resumed the driving of the 50 north, from the south shaft, and soon opened into nice ore ground; the lode is worth from ½ to 1 ton of lead per fathom. I now expect to find all the ground between the two shafts more or less productive from the 50 upwards, and where it is in whole to the 27. Looking at the question of the further and future development of the mine, I would strongly recommend the driving, as a pioneer level, either of the 110 or 84 northwards without interruption, when other deposits of ore would undoubtedly be found, and the situation immediately ahead of those levels consists of a mountain with a cover of 2000 ft. The sinking of the north shaft should not be further delayed; it ought to be proceeded with at once by a full force of men, and carried down 15 fms. before driving out a fresh level. The present returns of ore can be maintained, and I fully expect increased upon, as further discoveries are made, which will certainly follow by carrying out the drivings and sinking recommended, and I have still little or no doubt that the ultimate result of the company's perseverance will be a good and lasting mine. Subjoined is an account of ground driven and stoped since March last. We sampled 50 tons of lead on the 3rd inst. for sale on Tuesday next.—R. ROWE.

SUMMARY OF WORK DONE FROM MARCH, 1874, TO MARCH, 1875.

The 121 north, 25 fms. 4 ft. 6 in.; the 121 south, 5 fms.; the 110 north, 20 fms. 5 ft. 6 in.; the 84 north, 34 fms. 4 ft. 6 in.; the 60, south of south shaft, 28 fms.; the 60 north, 19 fms. 5 ft.; the 50 north, 6 fms. 0 ft. 9 in.: total, 140 fms. 2 ft. 3 in. Total quantity of ground stoped, 230 fms. 1 ft. 6 in. A great deal of work has been done also in repairing and improving the two shafts, and laying railroads in the principal working levels, and we have recently timbered and lined the north shaft from the 96 to the 121, ready for drawing with the machine kibble.

Telegram: April 13: 84 end much improved; lode 2 ft. wide, worth 15 cwts. per fathom. Country rock good.

The CHAIRMAN said the board were sorry they were not able to present the report before the meeting, but they had waited for Capt. Rowe's arrival from the Isle of Man, who had come over with other shareholders to attend the Great Laxey meeting to-morrow. He (the Chairman) did not know whether the shareholders quite followed the report of Capt. Rowe, which had just been read, as it was difficult to do so without the aid of a plan. It would probably be recollected that they had been in great hope of meeting with something of importance in the 60 south, which had been driven for some distance in the hill; some points were exceedingly promising, but a change of ground had taken place, and the lode split up, and as it did not look so well it had been thought advisable to stop the end for the time, to be resumed at some future period; there was no intention whatever of entirely abandoning that southern drivage—on the contrary, it was at some future time intended to continue it, as in connection with a similar cross-course the lode in Great Laxey had always materially improved. According to the dialling, the cross-course should have been reached, so that under any circumstances it could not be far distant, and whenever the funds allowed it would be highly desirable to further test this point. In the meantime it was proposed to confine their attention to the northern extensions, but more particularly to the sinking of the shaft to a further depth of (say) 15 fms. A telegram had been received announcing an improvement in the 84 north, where the lode was now worth 15 cwts. per fathom; and as in the 104 the ground had been of greater value than in the 84, and the latter being the pioneer level northward, there was every reason to look for satisfactory results in that direction. Shareholders would see by Capt. Rowe's report that the mine throughout in depth was gradually improving, and it was in depth they must look for their permanent profits. The ore deposits dipped northerly, and as had been indicated by the telegram the most northerly part was improving, while the level was being extended into virgin ground. As each level improved they were naturally enough encouraged to develope the mine to a greater depth, and as the lode would actually come into the shaft in depth, they were led to expect some assistance from that source towards the cost of sinking. Under any circumstances, there was everything to encourage them to sink the shaft a further depth of 15 fms., and strike out levels to reach the lode; and to enable them to do so they were about to appeal to the shareholders to subscribe for more of the unappropriated shares, for each one of which subscribed two bonus fully paid-up shares would be allotted; if applications were received for 600 of the unappropriated shares, it would probably be sufficient to pay the cost of sinking the shaft. The directors would take a large proportion between them, probably more than one-half, but still they hoped every shareholder would subscribe, and thus, while assisting to secure the object in view, participate in the valuable bonus offered in the shape of fully paid-up shares. He then moved that the report and accounts be received and adopted.

Mr. WHITE seconded the proposition.

Capt. ROWE (the manager) said the Chairman had fully and faithfully pointed out the leading characteristics of the mine, and also indicated what they wished to do for the future. He (Capt. Rowe) was very glad to feel that upon this occasion

they were in comparatively comfortable circumstances in the mine, and the additional capital asked for was for a specific work, which ought not fairly to come out of the present produce of the mine, that produce being the result of the average working, brought about by the small capital subscribed by the new company. They were now only realising the discoveries made by penetrating new ground and not previously taken away. To mine properly these reserves should be left to come in by-and-bye, and capital should do a certain amount of work. According to the present prospects, the mine could be made to pay its expenses; but by sinking the shaft would be the only way to work the mine, and for that purpose the necessary capital should be provided; and when that had been done they would, he believed, reach an available quantity of ore ground to mine legitimately and properly, and yield profitable results. He was decidedly of opinion that if the sinking of the north shaft be carried out by this extra capital they would not only discover a continuance of the ore bodies opened out, but a large extent of ore ground now being discovered northward; and that they would have ore ground in the south shaft, which would certainly secure the mine as a paying one and a permanent property. The mine was never in so good a position as now, either as the actual results or prospects. He held a stake in it, and should be quite willing to join the shareholders in subscribing the necessary additional capital.

Mr. LEWIN said that fortunes were lost in Great Laxey before depth had been reached, and Mr. Warington Smyth said it was the rule in the Isle of Man.

Capt. ROWE, in reply to a question, said the northern level was paying its way, and when stoped could be taken away for one-half.

The CHAIRMAN said there was one paragraph in the directors' report to which he wished to direct attention—that referring to the negociations for taking up the remainder of the shares. He wished to state that those negociations fell through in consequence of the death of one of the parties interested; and some delay arose from the directors having deemed it their duty to offer the shareholders the option of taking the shares in the first instance.

The report and accounts were received and adopted, and Messrs. Brandt and Stansfield were re-appointed auditors.

Upwards of 400 shares were agreed to be subscribed for in the room.

A vote of thanks to the Chairman and directors closed the proceedings.

DEER PARK MINING COMPANY.

The general meeting of shareholders was held at the company's offices, Moorgate-street, on Wednesday,

Mr. J. C. PARRY in the chair.

Mr. E. T. R. WILDE (the secretary) read the notice convening the meeting, and the subjoined report was submitted:—

April 6.—Agreeably to your instructions I, on April 1, carefully inspected the above-named mine, both at surface and underground, and herewith beg to submit to you my observations thereon.—Surface: Here I find a well-made, substantial, and effective 40-in. cylinder steam pumping-engine, with boilers, balance-bod, and all necessary connections, &c., complete; horse-whim, with poppet-heads, kibbles, and all the required appendages and apparatus, and a capstan, not as yet erected. In the reduction or dressing department I find a substantially built 56 feet diameter and 3 ft. breast water-wheel, with 12 heads of stamps erected, and other 12 heads lying on the ground to be made available or called into use when required. There are two well-made round buddles, with a shed over the washing apparatus, and also dressing-floors; small, but complete, office and burning house, with two ovens, and flue carried to a considerable distance below the surface of the ground, with chimney, &c.—Underground: First, a capacious engine-shaft, sunk to the depth of 58 fathoms below the surface, with pitwork complete, is securely timbered with dividings and casings, to form a drawing shaft, and it has a well-formed, substantial, and safe ladder-road or footway, for the descending and ascending of the miners throughout the whole depth. At the depth of 30 fathoms below the surface (called the 30 fm. level) a cross-cut has been driven south from the engine shaft 12 fathoms, where it has intersected the lode; a strong, well-defined, and to all appearance regularly-formed lode of (say) not less than 3 ft. wide, composed on the south wall of prian and a hard peachey capel, and not by any means of an unfavourable character for the production of tin. From the above-named cross-cut the level is extended on the lode 14 or 15 fathoms west, and at a distance of 11 fathoms from it they have passed through a large fine-looking cross-course, composed of friable sugary spar and flookan—a cross-course of a highly approved, favourable, and promising character. At what is called the 40—*i.e.*, 40 fms. from surface, or from the mouth of the engine-shaft—is the adit; this adit is taken up from the Tamar, and has been driven on the lode to a distance of some 150 fms. from its mouth, and 13 or 14 fathoms beyond the engine-shaft; here, again, in this 40, or adit level, a cross-cut 8 fathoms long has been put out south from the engine-shaft, and has intersected the lode, which is of the same size (from 3 to 4 ft.) and character that it presents in the level above (the 30). This adit, or 40 fm. level, has been driven, as before said, to the west of the cross-cut, or of the engine shaft, 13 or 14 fathoms, and by extending it another (say) 6 fathoms it may be expected to intersect the cross-course before noticed, as seen in the 30, or in the level above. This cross-course inclines towards the west, hence it is evident that it must be found at a greater distance from the cross-cut, or from the engine-shaft in the 40, than it is in the 30. The little diagram in pencil which accompanies this report shows the 30 cross-cut from the shaft to lode to be 12 fathoms long, and that in the 40, or adit, to be 8 fathoms, so that the underlie, or angle of inclination of the lode above the 40, can plainly and truly be seen; but I notice that in the 40 the inclination was greater, and the lode appeared to take a flatter direction towards the engine-shaft than it presented in the level above. Of course, it was merely the height of the level—say, 6 ft. run—from which I had to judge as to the continuation of the angle of the lode's underlie below the 40, but from the limited scope at which I had to look I judged the incline to be at an angle of 45°, or of 6 ft. in 1 fathom (this I remarked to Capts. Goldsworthy and Bucknell, who could not avoid seeing that it was so), in which case, if this angle of inclination continued to the shaft, a distance of 8 fathoms, the lode should have fallen into it at the depth of 8 fathoms below the 40. This, however, the captains tell me, never occurred, that in sinking from the 40 to 58 no lode was ever seen in the shaft. That this is a most unaccountable circumstance, and such as no man can determinately pronounce upon with certainty, I do not scruple to assert. If the lode in the 40 had assumed verticality, and had maintained a vertical position thence to the bottom, or 58 fm. level (a circumstance which I believe was never seen for such a depth or distance in any metallic vein), your 8 fathoms length of cross-cut in this level should be just touching it. Never having seen nor heard of a metallic vein maintaining its verticality for a depth of 18 fathoms I cannot suppose that yours had done so, and just as little do I think that it has altered its inclination from northerly to southerly (the latter phenomenon I am aware sometimes, but very rarely, presents itself), but seeing that the lode in question has maintained a regular and well-defined inclination towards the north, it is difficult for me to believe that it has altered it, and particularly so when I notice the apparent increased underlie in the 40, and but 8 fathoms from the shaft, hence I cannot recommend a continuation of the 58 cross-cut. Both the lode and the surrounding or encasing rock (the latter clay-slate) are very hard, and consequently expensive to work. Whether on the lode or in a cross-cut the driving of a level will cost from 10*l.* to 12*l.* per fathom; again, supposing that the lode has changed its underlie from north to south (a circumstance which, as before said, I cannot believe has taken place), and that at the same angle that it has above the 40 (which is not at all likely), you would have, as seen by the diagram, to continue the cross-cut on to R, a distance nearly equal to that already driven, and that, as before said, in my opinion, without any probable result; it is also difficult to imagine that a lode of such strength and substance as yours in the short distance of 8 fathoms should become, as it were, annihilated, or even to dwindle into insignificant and imperceptible branches; unless, however, that this has taken place I know not how to account for its disappearance. But supposing that the lode has degenerated, and that it has dwindled into minute branches before it reached the shaft, it by no means follows that a concentration shall not at a greater depth take place.

Forty or 50 fms. in from the mouth of the adit the lode suddenly opened from its wonted width of 3 or 4 ft. to 14 or 16 ft. Here they rose, stoped and sank a little, and extracted a small quantity of tin ore, but the place soon became poor. This lode, however, appears to be but one of the several lodes which you have in your sett, a sett of unusual dimensions, sufficiently large for two or three, having 800 fms. on the course of the lodes, and 600 fms. in breadth, embracing a superficial area of 400 acres. Your operations have, hitherto, been confined almost entirely to one lode out, it is said, of ten; so that if ever there was an object in working this piece of mineral ground that object still exists—still remains almost untouched, unaccomplished, and still holds out a promise to reward speculation (for speculation all mining must necessarily be) no less strong than it did at the beginning. In order to intersect your other lodes, and to prove their worth at some depth below the surface, I beg to recommend a continuation of the 40 on the lode home to the cross-conrse before mentioned, and which will be reached, in all probability, in about 6 fms. further driving. To drive on the lode these calculated 6 fms. would cost, say at most, 12*l.* per fathom, probably not above 11*l.*, and to drive on the cross-course would not cost above 3*l.* per fathom, whereas to drive a cross-cut through the general rock would cost not less than 12*l.* per fathom. Surely your undeveloped lodes should be intersected in depth, and the cheapest and best way to effect this is by driving on the cross-course. A steam-engine, small as it may be, is a great spendthrift; but to do what I suggest at the 40 or adit level it would not be required. It might be turned idle at once, when your cost would be wholly in labour. At the place at which you would strike the cross-course at the 40 you would have about 40 fms. of back, but by driving on it a few fathoms from the still rising ground you would have 50 fms. of virgin back overhead. At about 100 fms. to the south of the lode on which you have been working the back of an other tin lode is seen in the quarry, and again another, about an equal distance from the last mentioned, has been driven on some distance from the valley into the rising ground, but the timbering having given way the level was so crushed together that I could not succeed in getting in to examine the lode. To drive on the cross-course at the adit level, as suggested, with no steam-engine working, would not be attended with a heavy expense, and to extend the level to that point calculated to be about 6 fms. beyond the present end would occupy six men (say) two and a-half months or three months at most. To the extending of this level to reach the cross-course, and then driving on the same, I would recommend that for the present you confine your underground operations. The driving on this cross-course will discover your undeveloped lodes, the laying open of which was, doubtless, part of the object in setting the mine to work. Your sett being large I would recommend that a couple of intelligent, active miners should be employed for a time in costeaning—in sinking pits and running shallow drifts just below the surface in search of lodes. In order to expedite the driving on the cross-course at the adit level no fewer than six men should be employed thereon, six in this and two in costeaning—say, eight men altogether, working as miners. The carrying on of these operations would, I doubt not, be attended with satisfactory results. As before said, the inducement which was to work this piece of ground still is; scarcely anything has been done to alter the prospects or the position. I do not see anything that has been done in the mine to call forth disapproval, unless it be the position selected for the engine-shaft, which would appear to have been prematurely sunk—*i.e.*, before the character and merits of the lode had, by further development, been ascertained, so as to indicate the propes and most advantageous place in which to sink it. Mistakes in this respect are not unfrequently made, and when made they are found to be weighty ones—after further development the shaft is found to be in the wrong place, a new one has to be sunk and the engine removed. It is impossible to say with certainty that this will be the case with you, but you will observe, as shown by the plan of the mine, that your engine-shaft has been sunk in a corner at the very extremity of your sett. I do not know that I have any further remarks to make, but would just ad I that should you feel pleased to carry out the work which I suggest, I doubt not that the result will be satisfactory, and that the cost of doing so will not be heavy.—JOHN LEAN.

The CHAIRMAN suggested that the meeting should be adjourned for a fortnight, in order that the result of the committee's labour might be communicated to the shareholders, when there was no doubt that they would appreciate the desirability of providing the additional funds necessary for the further working of the 40.

Messrs. W. M. DEACON and A. T. POPHAM stated, on behalf the committee, that immediately on their appointment they took the necessary steps to obtain the best possible opinion as to the mine, selecting Mr. John Lean, who was recommended by the School of Mines, and has had large experience in mining operations.

After a brief discussion, it was proposed by Mr. STRONG, seconded by Mr. JOHN WRIGHT, and agreed that having considered Capt. Lean's report, and considering also the recommendations of the committee, it was unanimously resolved that 1500*l.* be raised for the purpose of carrying out the suggestions for working the mine, and that the meeting be adjourned until April 28.

The thanks of the meeting having been voted to the committee for their valuable services, and to the Chairman for his conduct in the chair, the proceeding s terminated.

GREAT SNOWDEN MOUNTAIN COPPER MINING COMPANY.

The adjourned extraordinary general meeting of shareholders was held on Wednesday, at the London Tavern,

Mr. R. CHARLES in the chair.

Mr. CROSBIE (the secretary) read the notice calling the meeting.

The CHAIRMAN said he must, in the first place, explain the present position of the company. It would be in the recollection of those present that at the extraordinary general meeting held on March 24, instead of passing a resolution for the voluntary winding-up of the company it had been decided, after some little discussion and consultation, to appoint a committee of shareholders to co-operate with the directors in an investigation into the mode in which the company had been managed, and to endeavour to frame such a report as to justify the subscription of the capital for carrying on the business of the concern. The directors had been most desirous of giving the fullest information, and of working in the spirit of the resolution appointing the committee, but he was bound to state that the board, nor any single member of it, had ever been consulted or asked to give any help. There was no report of the joint committee as they had never met, and the document proposed to be read to the meeting was consequently not in proper order; it must, therefore, be necessarily inaccurate and misleading. The auditors had also declined to pass any accounts embracing the expenses that had been incurred. He would conclude by remarking that if any investigation of the company's affairs took place, which the directors were most anxious should take place, it should be done in the winding-up of the undertaking. He (the Chairman) then moved that the company be wound-up voluntarily.

Mr. CLARKE (chairman of the committee), when about to read the report of the committee) was interrupted by

The CHAIRMAN, who said that while there was not the least desire on the part of the board to shirk enquiry in any way, yet he could not accept any report that might be presented that was not a joint report.

Mr. WILKES, as one of the members of the committee, said that the action of the Chairman in opposing the reading of the committee's report was not characterised by the same spirit in which he and his colleagues had tried to pursue the investigation. Some of the the members of the direction were friends both of himself and of Mr. Clarke, and they had endeavoured to carry out this work of enquiry in the spirit of the resolution which had appointed that committee. He thought that the report of the committee should be read, as it exactly stated the proceedings of the committee.

The CHAIRMAN said that the committee could not be correct in the statements they had made, as they could not, without consulting the directors and the solicitor of the company have ever come to a proper conclusion; not that he personally objected to anything the committee had done, but that as a matter of strict business he could not allow the report to be read.

Mr. WILKES said he wished to assure the meeting that the committee had been most wishful to conduct the investigation in a friendly spirit, and to be able to present a report which would obtain the money of the shareholders.

Mr. CLARKE said that the directors had received just as much notice of the holding of their meetings as the members of the committee, but they had never attended. He thought they might have saved a great deal of trouble if they had done so, but by not doing so they they had deprived themselves of the right of complaining of the proceedings of the committee. They had arrived at what they thought to be an impartial conclusion, and that was that the company should be voluntarily wound-up. (Hear, hear.)

The CHAIRMAN again moved that the company should be wound-up voluntarily.

A SHAREHOLDER asked if the resolution passed at the last meeting was legal?

The CHAIRMAN answered that if it was supposed to authorise an investigation of the company's affairs without a resolution of a meeting duly convened, it was in contravention of the Articles of Association, and therefore *was* illegal. But if, as intended at the time, it was merely the appointment of some of shareholders to confer with and assist the directors, it was free from objection.

Capt. CHAPMAN observed that the committee had never from the first moment of its existence carried out the principles for which it was formed, for it had never invited the directors to be present at its meetings, and its proceedings were of a most irregular character.

Mr. ROBERTS said the meetings had been held at the offices of the company, to which, of course, they had free access.

The CHAIRMAN considered he had received his dismissal when he was told by Mr. Clarke at the first meeting he attended that the committee would send for him when they wanted him.

Mr. LAY thought the best course would be to wind-up the company in a friendly spirit, as the meeting seemed to agree to that motion, and if there were anything for the shareholders well and good, but if not there should be no unpleasantness. To attain that he would suggest that an independent liquidator should be appointed. If the direction would adopt that course he was ready to propose a gentleman, tleman for that office.

Mr. SPARGO (a shareholder) proposed that the company be wound-up voluntarily, and that Mr. Kemp be appointed liquidator in conjunction with Messrs. Charles and Crosbie.——The CHAIRMAN, having withdrawn his name from the begged to second it.

Mr. WILKES thought the directors ought to allow the committee's report to be read after having been assured that the investigation had been conducted in a friendly spirit.

The CHAIRMAN said he was quite decided on that point.

Mr. CLARKE said the refusal of the Chairman might naturally give rise to an impression that he was afraid the report might contain statements adverse to the management.

Mr. WILKES said the committee refused to take part in the proceedings if the Chairman would not hear their report read.

Mr. MCEWEN had he opposed the reading of the report on the ground that it might contain statements which, without explanation, might mislead the meeting, and if explanations took place, the time allowed for the meeting would not suffice; he also complained that no copy of the proposed report had been furnished to himself or any of the directors.

After some discussion, it was proposed and seconded that the company be wound up voluntarily, and that Messrs. Kemp and Crosbie be appointed liquidators.

Mr. ROBERTS proposed that Mr. Butt, of Moorgate-street, be the liquidator, and then gave his reasons for not wishing for the appointment of the first-named gentleman. He desired an independent liquidator, and did not wish that either, their Chairman, secretary, or auditor should be appointed to that post.

Mr. MCEWEN opposed the appointment of Mr. Butt in place of Mr. Kemp, as it would be a mark of want of confidence in the directors, and to appoint both would be an unnecessary expense.

Mr. CLARKE seconded Mr. Roberts's amendment, which was then put, and lost.

A poll was demanded, and on the votes being taken a similar result ensued. The original motion as to the winding up of the Company, and the appointment of Messrs. Kemp and Crosby as liquidators, was carried by a large majority.

The proceedings were then brought to a close.

WICKLOW COPPER MINE COMPANY.

The half-yearly meeting of shareholders was held in the offices of the company, Grafton-street, Dublin, on Thursday, when the following directors' report was presented:—

Notwithstanding that the company's operations have shared, with those of other similar undertakings, the contraction resulting from the continued depression of the chemical and iron trades, yet it will be observed by the accounts that a small profit has been made on the working of the mine during the half-year. This depression still limits the amount of business to be done in both sulphur and iron; but with its termination, and the consequent revival of manufacturing activity, your directors calculate upon a resumption of the demand for the company's ores. The mine is in a condition to yield as large a quantity of ore as in the most productive times of the past, when the demand arises. The amount expended on tutwork during the half-year was on a fairly liberal scale, and was employed in developing the iron lode, and this has been accomplished, and the works and plant maintained with a close regard to economy and efficiency, under the able superintendence of the company's manager. The causes which render the ore trade so comparatively quiet also operate to retard the disposal of the Arklow Chemical Works; but your directors feel confident that the advantages which those works possess for making cheap sulphuric acid, with the other favourable circumstances in connection with them, will not be much longer overlooked by parties wanting buildings for the manufacture of chemicals or artificial manures; and in the meantime, the works have been maintained in a proper state of repair. The item for law costs in the half-year's accounts is principally composed of the legal charges in connection with the settlement of the claims of the representatives of John Howard Kyan and Turner Camac, and the liabilities upon which claims are finally disposed of by this debit. It will be seen that the company have ample resources to discharge the balance of the debentures when the opportunity offers; and by the redemption of the bonds a saving of interest willl be effected, which will go to augment the fund for dividend. In view of the large mineral resources and the excellent working condition of the mine, and the healthy financial position of the company, your directors look with confience to a revival in trade as the principal condition wanting to the earning of a divisible profit.

Mr. John Hodge, the manager, says:—"The steam-engines and pumping machinery have been kept in an efficient state at a trifling expense. These, with the various tramways and inclines, will be found in a fit state to perform a great amount of work, when an increased demand for the ores produced in these mines arises."

SOUTH CARN BREA MINING COMPANY.

A meeting of adventurers was held on April 8, at the mine, the purser, Mr. W. PIKE, presiding. The general depression of the tin trade has made itself manifest here as elsewhere. An adverse balance of nearly 1000*l.* was reported, but at the same time the prospects of the mine being in one or two quarters of a most satisfactory and encouraging nature, much hope is felt for the future.

Capt. RICH said they had a very fine lode in the 164 west, and he was sorry to be obliged to leave off prosecuting it until the dry season.

Mr. MILLS said some nine months ago they made a profit of 800*l.*, and since that he had ascertained they had made calls to the amount of just 1000*l.* He desired information on this point, asking whether the adverse state of accounts was not so much caused by an excessive cost as by decreased returns?——Capt. RICH replied in the affirmative.——Mr. MILLS: How do you account for it?——Capt. RICH: We have taken away the metal in back of the 140, and the bottom is not fit to be worked yet.——Mr. MILLS: Some persons have intimated that it is entirely gone.——The PURSER: No, it is there still.

Capt. RICH: All I can say is that we drove over the level, and two men in a month raised 8 tons of tin, and looking at the ground we have gone over we believe there is a very fine lode there. The decreased returns, no doubt, cause the adverse balance, but as far as the prospects of the mine are concerned they are altogether very good. In the 164 west we have just haf a mile of good ground, with as fine a lode as was ever seen, but the cost of sinking the level cripples us. It has cost 1000*l.*

——Capt. RICH: That all depends upon the force brought to bear upon it; if we were to put down a skip-shaft we should soon get down there, but we want to reach the next level in the 164 to see how that will turn out.

The accounts were then passed, and the PURSER moved that a call of 4*s.* per share be made; that, he said, would produce 1000*l.*; there was always a small amount allowed as discount, and so the debit balance would be just covered.——Capt. JAMES seconded the motion, saying they must either pay their debts or stop the concern.

The call was made, and the meeting terminated.—*Western Daily Mercury.*

LUSITANIAN MINING COMPANY.

The annual meeting of shareholders was held at the offices, Queen-street-place, on Monday,—Mr. H. REEVE, C.B., in the chair.

Mr. W. G. WILLIAMS (the secretary) read the notice convening the meeting.

The report of the directors stated that the falling off in the returns of ore recovered before the year expired, some improvements having taken place in the mine; but the prices realised for the produce have proved to be much below what they were even in the preceding year, and, on the other hand, the costs of working were from various causes somewhat higher, so that these two circumstances have combined to produce an unsatisfactory result. Certainly there was no anticipation on the part of the directors at the time of the last general meeting that the value of the year's returns would fall as far short as they have done of covering the costs, as at that time only about 60 tons of the ore raised since Oct. 1, 1873, had been realised. The quantity of ore raised from the Palhal Mine during the past year was slightly larger than during the preceding year; but the prices it was sold at were so much lower than before that there is a decrease in value of 735*l.* This is partly accounted for by the assays for copper and silver having turned out somewhat lower than before, and partly by the state of the copper market. The increase in the costs was chiefly caused by a higher rate of expenditure in working the mines, and in the transport of ore to Oporto. Attention has been bestowed on the question of the best means of disposing of the nickel and cobalt ores, and it is now thought a good market has been found for them, and that more speedy sales of this mineral will henceforth be effected. At Carvalhal the expenditure has been continually reduced, and it is now brought down to the lowest point consistent with the concession being retained, the actual mining cost for the first five months of the current year having averaged only 14*l.* per month, as against 51*l.* 11*s.* of the preceding year.

The CHAIRMAN said the report now submitted differed materially from what they had hoped the last time he had addressed the shareholders. The operations had resulted in a considerable loss, which had compelled the directors last summer to make a call to encounter the difficulties in working the mines. In dealing with the accounts it must be borne in mind that they were made up to Sept. 30, 1874; and it appeared that in dealing with a somewhat remote interest, and whose produce could not be rapidly realised, it was found that insurmountable difficulties prevented the accounts being brought up closer, and it was also important to remember that in these accounts credit was not taken for anything but what had been actually realised, and that a considerable interval of time elapsed between the raising of the ore and its realisation at Swansea. At the present moment, for instance, there was a produce of six months, representing in actual value some 5000*l.*, which had not yet come in—so that they were in reality dealing with past quantities without any certain knowledge as to the present. At the last general meeting the directors had been led into a misconception of the true position of the company; the year previously had been relatively prosperous, and he must confess that the prospects held out by the discoveries and opening up of a market for their cobalt ores induced them to take too favourable a view of prospects of the concern; but if that had been the case last year he would beg shareholders not to fall into the opposite error, because the present accounts were not so unfavourable as they would lead one to suppose. If up to the present time they had gone on losing money, and the prospects had not improved, it would probably have become urgently necessary to have considered the best course as to the future; but in making any statement he wished to guard it with great care, so as not to make it of too hopeful a character. As stated in the report, as soon as the directors became aware that the produce did not meet the costs they dispatched Mr. Cruickshank to Portugal to restrict the cost as much as possible; and the effect had been a reduction in the expenditure at the mine of 150*l.* per month; as far as they could gather, the standing expenditure, instead of being as heretofore 600*l.* during the six months, had been reduced to a little more than 5000*l.*, while the ore raised was rather in excess of the preceding period—this was to be borne in mind, as during the past six months the returns had not only not fallen off, but had in some respects improved in quality. They had had great difficulty in bringing to market their cobalt ores, notwithstanding that the price realised had been favourable; a parcel had been sent to market, which he had been informed had been valued at 30*l.* per ton, and by an arrangement with a house there was reason to believe these cobalt ores could now be more easily brought to market. As far as they could tell, since Sept. 30 to the present time the mine had not incurred loss; on the contrary, there seemed reason to believe there had been a small profit—a fact which he was extremely anxious shareholders should realise, because it bore upon the future course which might be pursued. Although the quantity of copper ore raised had been rather more than during the previous year the price obtained had, unfortunately, been lower. The impression he wished to convey was that at the present time, according to the best belief, they were not losing money, and that there were some mining features favourable to the concern; and the production of cobalt and nickel seemed to be considerable—whilst he believed the difficulty of bringing it to market had been overcome. Last year they realised from 70*l.* to 75*l.*, and if the supply should continue it might have an important bearing upon the concern, even if the price of copper remained low. As to the mine the deepest part was far the best, and it was clear the best part must be worth exploring—it was the opinion of the directors that it was extremely desirable so far to persevere to, at least, test the value of the lode beyond the "slide," and they had a hope that for a limited time the workings could be carried on without loss, and holding as they did a very considerable interest in the undertaking—the directors and their friends representing nearly one-half the mine—they were of opinion it was worth while persevering for the purpose of testing these latest discoveries, and also the effect upon the results produced by the sale of the cobalt ores. Should they again be disappointed it might be proper to consider how much further they should persevere. He then moved that the report and accounts be received and adopted.

Mr. JUDD seconded the proposition.

Capt. LYONS said that since 1867 he had continued to attend these meetings, and at that time he proposed that the company should be wound-up for reasons he then gave—that a poor copper company could not longer pay. The directors entirely differed from him, and the company had been carried on since, the result of which had been that calls had been made to the amount of 30*s.* per share, and the shareholders had received back 2*s.* 6*d.* per share, while the company was now in a much worse state than then. Having referred to various passages in the reports and items in the accounts, he moved as an amendment, "That the report be neither received nor adopted, that the directors and managing directors be called upon to resign, and that a general meeting of shareholders be summoned to decide whether the working of the mines be continued under new management, or the property be sold, and the company wound-up."

The CHAIRMAN, in reply, stated that the directors had not received anything at all for fees during the last 18 months. There had not been any correspondence between the directors and Mr. Pinto Basto of an unpleasant character; the only correspondence had been about the call which Mr. Basto had paid. The calls generally had been extremely well paid; the directors had been obliged to forfeit a few shares belonging to deceased shareholders, but the whole number did not exceed 100, which was very inconsiderable for a company that had been in existence for 20 years. The purchased land referred to by Capt. Lyons had been secured to prevent disputes and quarrels among the tenants, the whole costing 590*l.*, and the mines running in a part of the ground, and having got the ground it was extremely desirable surely to use the surface as well; they were advised to plant trees which grew rapidly, and became an extremely valuable asset. Should their mine continue a few years these trees would become of great value; and if, on the other hand, the property were transferred to other hands the timber would increase in value year by year.

Mr. FRANCIS said that at the time permission was asked of, and obtained from, the shareholders for the purchase of this land.

Mr. JOHN TAYLOR was extremely sorry that Capt. Lyons, who held such a small interest in the company, should continue year after year to pursue such an objectionable course. Why did not Capt. Lyons abandon his interest? The directors each held a far larger interest than Capt. Lyons, and meant to persevere with the enterprise, and for the simple reason that they believed they had a property that would become valuable. The Carvalhal Mine was upon the same lode as one of the richest mines in the country; there was no steam-engine required, the levels were simply driven into the hills, and he believed that if the company had capital it would prove a splendid concern. Latterly at Palhal the prospects did not point to speedy results, but they did not like to part with the mine if possible. Capt. Lyons had referred to the bills—all bills were merely drawn by their cashier to pay the wages, and there were no other bills ever drawn. The point of encouragement at Palhal, referred to in the report, was this:—The 160 was driven 9 fms. when we reached, as was supposed, the slide lode, but from the appearance of the stopes working in the back of this level, the ore ground has not been cut off by the slide, and is found to be longer than was expected. Our agents remark that the underlie of that part of the lode called Basto's lode, west of the slide, which it was supposed was dislocated by the slide, and thrown laterally at the adit level, about 30 fathoms, underlies faster north than that to the east of the slide in which Taylor's engine-shaft is sunk, and they now think it highly probable that about the 160 fathom level the two parts may be opposite, and that there may be almost a continuation of the lode. Should this prove to be correct it may have considerable influence on the future value of the mine. This remarkable slide passed through the main vein; there was a very large range of mining, and the rock of the same character as that in which the best mines were found; the veins were well defined, and they had ample water

power, an excellent agent, and excellent workmen, and he was perfectly sure that if it were shown good grounds existed, and it became necessary, another call would be readily responded to. By the indications at present the directors certainly hoped to avoid making another call, but did not make any promises on the point, for if financial difficulties came upon them they would be obliged to make a call. The lode in the bottom of the mine was strong and rich, and the ore always realised a very good price indeed, containing not only copper but a notable quantity of silver; for the last two or three years the mine had not looked so well as at the present time.

The amendment proposed by Capt. Lyons was not seconded, and the motion adopting the report and accounts was put and carried, with one dissentient (Capt. Lyons). The retiring directors were re-elected, as also the auditors.

Upon the proposition of Capt. LYONS, seconded by Mr. FRANCIS, a vote of thanks was passed to the Chairman, which closed the proceedings.

LINARES LEAD MINING COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Queen-street-place, on Thursday,

Mr. W. Cox in the chair.

Mr. H. SWAFFIELD (the secretary) read the notice convening the meeting, which was thereupon declared duly constituted by the Chairman, and the report and accounts, an abstract of which was published in last week's *Mining Journal*, were taken as read.

The CHAIRMAN said that the report and accounts having been taken as read, it became his duty to submit the first resolution, that the report and accounts be received and adopted. He had but few observations to make, as the report contained all they had to communicate; and he had no doubt all had read the report, yet he might be permitted to make one or two observations. During the past half-year they had realised a profit of 4133*l.* against 1159*l.* in the preceding half-year, and he might congratulate them that this extra profit was made by the produce of the mine, and without any diminution in the works carried on for the development of the mine. The mine had shown an improvement, and they had obtained a better price for their lead. They would recollect that last year they charged 880*l.* to the reserve fund in respect of outlay they had made for permanent works, but in the present accounts they had made no such charge; and not only so, but they had returned the 880*l.* to the reserve fund, raising the amount in Consols to 3000*l.*, as before. Some of his friends could not believe in a mining company being a permanent investment, but in the case of the Linares Company they commenced paying dividends 22 years ago, and since that time had distributed 214,850*l.* in dividends. That amounted to 15*l.* 4s. 2d. per share, or five times the amount of the capital of the company. Now, 22 years, although not absolutely a permanency, looked very much like one; and when they asked what was the percentage which they had paid during that time they found that it came up to an average of 21 per cent. per annum which they had had for their money. Their prospects were most cheering, and he only hoped they would continue to have a good price for lead. In a concern like theirs, where they were selling 4000 tons in the 12 months, the difference between 19*l.* and 24*l.* per ton made an important difference in their profits, for it must be recollected that 5*l.* on 4000 was equal to 20,000*l.*, which was sufficient to pay them a dividend of 40 per cent. upon their capital. At the present moment the price of lead was not quite so good as it had been, and they had sold as low as 19*l.* 10s. per ton; but they had since made sales at 20*l.*, and had to-day refused 20*l.* 10s. per ton. They had, moreover, 15,000*l.* available balance, after paying back the capital five times over, as he had already told them, and this was represented by lead; they had also their plant, freehold houses, machinery, and all their magnificent property at Linares. He concluded by formally moving that the report and accounts be received and adopted.——Mr. BALFOUR seconded the motion.

Mr. PARTINGTON thought nothing could be more satisfactory than the report which had been presented to them, and that the managers ought to be much congratulated upon the position of the mine and of the company.

Mr. TAYLOR said it was extremely gratifying to him to hear the report and accounts were so satisfactory to the shareholders, and he might say that it was certainly their desire that everyone should understand all about the property. He could assure them that nothing known to them was kept from the shareholders. The history of the success of these mines was that from lucky circumstances they invested their money in a part of Spain where the veins were very rich; but he did not hesitate to say that if they had been worked as some mines were worked they would have come to an end long ago, and perhaps been condemned as worthless instead of being now in the brilliant position they were. Mr. Cox had told them that they had received 21 per cent. per annum on the average for their money, but he might say that he and his brother always looked for 20 per cent. profit on mines, or they were not worth working. But it was the way in which their money had been expended upon works of extension and development that had enabled them to make the mines remunerative. They would see from the plan how far they had extended the mine. Near Pozo Ancho, which simply meant a wide shaft, there was a good lode, but they would have failed to get the advantage of it if they had not kept on opening out continuously. Quinientos, as they were aware, was now helping them; it had now given them 150 tons of ore per month for the last five or six months, and the bottom levels were looking well. They had obtained 238 tons of ore in the last three months, worth nearly 80 per cent. of lead, which is a large return. He was glad to say that they were not interfered with by the Carlist war, and had no strikes or delegates to trouble them. The miner had his bread, onion, and wine—the Valde Penas, and goes contentedly to work at six o'clock in the morning. Their men were not very strong, but they were very willing and industrious, and they could not desire better. He might explain that the company had always paid the men in cash at the end of every fortnight, and it was coin that they could understand; this had, no doubt, given them facilities for dealing with them which they would not otherwise have possessed. That being the case, he felt he had a right to congratulate the shareholders upon the possession of such a property, and he saw no appearance to lead them to suppose that they would do other than go on extending the mine for years to come. They had had a good price for lead during the past half-year, and there was a promise of a fair price for the current half-year. He would not say that they were not 1s. in debt, but they did not owe 1s. which they had not ample to cover, and they had not a bill under discount. The old Linares part was so far worked out, but at the present price of lead it yielded them some profit, and would long continue to do so. They had only attained a depth of 120 fms., and had one of the best engines in the district on the shaft, so that they might when lead was higher decide upon going deeper. The mine fell off, however, at the 100, and was poorer at the 110; but the next mine to the south belonging to the Government had proved productive to twice the depth; the two veins are as near parallel as possible. He would certainly be for a deep trial as soon as the price of lead encouraged it. For 150*l.* per month, or 2000*l.* a-year, they would do it well; or for 200*l.* per month perhaps better, and he thought they might do well to endeavour to revive the old mine.

The reports and accounts were then unanimously adopted; Messrs. Cox, Judd, and Henty were re-elected directors, and the election of Mr. H. D. Abercrombie in the room of Mr. Henderson, deceased, was confirmed. Mr. F. W. Bigge was re-elected auditor, and Mr. Edward L. Agar was elected auditor in the place of Mr. Abercrombie, promoted. Upon the proposition of Mr. PARTINGTON the best thanks of the meeting were voted to the Chairman and directors.

Mr. COX, on the part of himself and his brother directors, could assure the shareholders that they had done their best to deserve the vote; but thanked them equally for it, and might say that he had frequently seen other boards which deserved it as much fail to get it because they were less successful. They had a surplus capital available, but they were careful to expend it to the best advantage. When they found in sinking the old Pozo Ancho that the appearances were more discouraging at the 90 than in the previous level, still more discouraging at the 100, and very poor at the 120, they determined to defer the sinking until a more favourable opportunity presented itself. He was naturally anxious that there should be no unnecessary outlay, as every 15*l.* expended at Linares took 1*l.* out of his own pocket. When he was in Spain there was one mine which was favourably spoken of by everyone—there were many mines on which some expressed a favourable opinion—and that was the Quinientos, and it became a question whether they should take the Quinientos or deepen the old mine. Whenever they have a good price for lead (say) 22*l.* 10s. to 24*l.*, he would devote money for deepening the old Pozo Ancho. He had stood for hours at the Government mine and seen rich lead coming up from the 170, so that the trial of the Pozo Ancho in depth was certainly worth making.

The proceedings then terminated. ——

ALAMILLOS MINING COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Queen-street-place, on Thursday,

[Mr. J. PHILLIPPS JUDD in the chair.

Mr. H. SWAFFIELD (the secretary) read the notice convening the meeting, which was thereupon declared duly constituted by the Chairman, and the report and accounts, an abstract of which was published in last week's Journal, were taken as read.

The CHAIRMAN, in moving the reception and adoption of the report and accounts, remarked that it was always a pleasing duty when there was nothing but matters for congratulation to bring before them. Their profit had exceeded by 1500*l.* that of the preceding half-year. There was a slight falling off in the quantity of ore obtained from the mine, but as there had been a corresponding reduction in the cost they were enabled to pay the same dividend as before, and also to carry forward a good balance. It was not his province to talk of the technical details of the mining operations, which would be much better dealt with by his friend, Mr. Taylor, but he might observe that if the produce remained as at present there was no doubt that dividends would continue. It was the old story of the price of lead, and he hoped that when he had the pleasure of appearing before them again he would be in a position to tell them that the improvement which now promised had been realised, and that they had thus earned a larger dividend.

A SHAREHOLDER understood that there had been a slight falling off in the production, and would be glad to learn how this happened.

Mr. TAYLOR said that the barometer of the Stock Exchange dealings in their shares would tell them whether their levels were improving or otherwise. The reports from the mines were published weekly, and if those dealing in the shares on the Stock Exchange saw that the levels looked better or worse the price of shares varied accordingly. The levels during the past twelvemonth—he might almost say during the past two years—had not been rich, but at the present moment they were better than they had been for a considerable time, yet they had not been so rich as they could desire. The mine was a very long one, but the engine was, whether fortunately or unfortunately, he could scarcely say, in a barren piece of ground, but near it was the Magdelena Mine, which was a valuable one, and he believed there was a very good mine away to the west which he hoped in a few years would add largely to their returns. There was, however, in this property a slide or dislocation which passes through the lode at a certain depth, and made it very poor. When they got below the slide, and beyond its influence, the lode was very good again, and their last report told them that they were getting 3 tons per fathom below the slide. The power they have is ample for working the mine, and the water insignificant; indeed, they required every drop for dressing, supplying their engines, and other purposes. But the answer to the shareholder's question was, that for the last two years the levels had been very poor; they had, however, been able to raise enough to keep things going, and they had been able to give them dividends. For the last two years the mine had never looked so well as at present, so that they need not fear for the future.

The report and accounts were then unanimously adopted; Messrs. Peill and Abercrombie were re-elected directors, and the election of Mr. F. W. Bigge, in the place of Mr. Henderson, deceased, was confirmed; Mr. E. Bunny was re-elected auditor; and Mr. W. Carter was appointed an auditor, in the place of Mr. Bigge, promoted.

Thanks were then voted to the Chairman and directors, and in acknowledging the compliment the CHAIRMAN remarked that the directors held so large a number of shares that the shareholders were certain to have their interests well looked after.

The proceedings then terminated. ——

FORTUNA COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Queen-street-place, on Thursday,

Mr. R. HENTY in the chair.

Mr. H. SWAFFIELD (the secretary) read the notice convening the meeting, which was thereupon declared duly constituted by the Chairman, and the report and accounts, an abstract of which was published in last week's *Mining Journal*, were taken as read.

The CHAIRMAN, in moving the reception and adoption of the report and accounts, said they had last half-year made the large profit of 10,000*l.*, and had paid good dividends, which he hoped would prove satisfactory to the shareholders. They had raised about the usual quantity of ore, and had realised a good price for their produce, although for the last few weeks the rates had been somewhat lower. In spite of all the work they had done at the mine out of revenue, and the dividends paid, they had now 4500*l.* as a reserved fund. They had been in operation for 12½ years, and during that time had divided 126,000*l.* among the shareholders, being at the rate of 5*l.* 1s. 4d. per share, or a return of the capital subscribed two and a half times over. They had upon the average received 18 7-10ths. per cent. per annum for their money, and last year they received 25 per cent., so that there must be a feeling of satisfaction among them all. No one who had not been in the position of a director could appreciate the difference of feelings in meeting shareholders with a favourable and with an unfavourable account; and in the case of the Fortuna Company the directors, being by far the largest shareholders, had not only the stimulus of coming before the shareholders with a satisfactory report, but also their own individual interest. He hoped that the shareholders would not suppose that, because he did not deal with the mining details, leaving that to Mr. Taylor, that such details were not thoroughly looked into at the meetings of the board. The very reverse was the case. Not a piece of machinery was purchased, or any other important step taken, until the matter had been fully discussed. He concluded by formally moving the resolution, and upon its being seconded called upon Mr. Taylor to state the position of the mine.

Mr. TAYLOR said that the history of their present position was so fully given in the report, which had been printed, and which they had no doubt all read, that he had really but little to add. It was a matter of congratulation to his brother and himself that this concern was now in so prosperous a position after so long struggling. They had had all sorts of difficulties to contend with since its establishment, and had even had to go to the shareholders for 15,000*l.* upon debenture, which, however, had now all been repaid. The advantage of the Fortuna property was that it consisted of several distinct mines. Los Salidos had been a gem of a mine; and their Graciosa Mine, which was a small pertenencia 300 yards long, he believed to be on the Salidos vein. There was no vein in Spain which had yielded an equal quantity of rich ore to Los Salidos, though some had yielded small quantities of richer. It was a beautifully fine ore, and required very little dressing. He believed that in the west they had a very valuable piece of ground, although that was not the general opinion in the district. In Canada Incosa there is a large space of poor ground, but he could not think it was without ore, and believed it would reward them. They continued to open out the property with great vigour, and they go on getting about 350 tons of lead washed up monthly to about 78 per cent. for lead, with fair quantities of silver. They had no delegates or fellows of that kind to trouble them, and the men were working well, and earning good wages. Their medical man at Fortuna had invented a medicine, the composition of which he would not tell them, though he might be induced to give them the receipe before he died, which had a wonderful curative effect upon the men attacked with lead sickness, and he knew Val de Penas formed a large ingredient. Carriage was slightly cheapening, though not much; and in respect of conscription, they had not been much inconvenienced, and were very well treated by the Government.

The report and accounts were then unanimously adopted, Messrs. Cox, Abercrombie, and R. Taylor were re-elected directors, and Messrs. Dorington and Bunny auditors, the proceedings terminating with the usual complimentary vote to the Chairman and directors, which was duly acknowledged.

ARUBA ISLAND GOLD MINING COMPANY.

The third general meeting of the shareholders was held at the offices, Gresham House, Old Broad-street, on Thursday,—Mr. G. B. SARGENT (in the absence of Lord Hay) was voted to the chair.

Mr. ARCHD. MACKENZIE, (secretary) read the notice convening the meeting.

The report of the directors stated that in accordance with the resolution passed at the general meeting on Sept. 24, that the sum of 10,000*l.* be raised by the issue of first mortgage debentures of the company, and offered *pro rata* to the shareholders, the directors beg to report that, in response to the appeal made, the shareholders subscribed 2290*l.*, and that the balance of the debentures, amounting to 7710*l.*, were allotted in terms of the said resolution to Mr. George B. Sargent, to be paid for as funds were required for the company's use. Mr. R. W. Newman having resigned his position as general manager of the company's affairs at Aruba, the board, after due consideration, re-appointed the former superintendent, Mr. B. F. Rule, and gave him full instructions to erect and test all the machinery upon the island as originally intended by its designer. Mr. Rule, with two assistants, sailed on Dec. 17, and arrived at Aruba on Jan. 17. Another assistant arrived at Aruba on Feb. 9. According to the latest advices received from Mr. Rule, dated Feb. 19, the work of erecting all the machinery was progressing favourably, and it was expected that 15 stamps, with the Blake's stone crusher, amalgamators, and concentrators would be running on an early day with wind-power. The erection of the steam-engine and boilers would follow as soon as practicable. Wagon roads to different mines were being constructed, with the intention of using wagons and mules for the conveyance of ores, in order to save a portion of the expense of transportation. The total amount of gold reported as obtained from the crushing of 215½ tons of selected quartz has produced 136*l.* In addition to this 30*l.* has been obtained from the crushing of 36¼ tons of selected quartz. The average yield of fine gold obtained from these crushings is 1 oz. 13 dwts. 14 grs. per ton of quartz. In December last 27 bags, containing about 2700 lbs. of crushed selected ore and of tailings, were received from Aruba, samples from which were assayed with the following results:—Per Mr. Claudet's certificate—(gold) crushed quartz, 1 oz. 19 dwts.; tailings, 1 oz. 12 dwts. 6 grs. per ton. Per Vivian and Sons' certificate—(gold) crushed quartz, 1 oz. 17 dwts. 9 grs.; tailings, 1 oz. 0 dwts. 14 grs. per ton. Two other samples of tailings were previously received from Aruba, but as they were not in sealed or properly authenticated packages, the directors refrain from giving the assays, particularly as the result of the actual working of some of the gold ores may be expected to be received here during the next 90 days, and will be made the subject of a special report to the shareholders.

Phosphate of Lime: The question raised as to the rights of this company to the mineral phosphates of lime is still undecided by the Court at Curacoa. The board have taken active measures to bring it to an immediate decision, and, if necessary, to appeal to the Supreme Courts in Holland. At the request of the board, Mr. Sargent visited the Hague in January and March last, and had personal interviews with the company's attorney and the Government officials there regarding the company's rights, and it is the opinion of the attorney that they will be fully established.

The CHAIRMAN said the directors did not wish to express any opinion of the property, owing to the want of success that had heretofore attended the operations. They had decided to carry out the erection of the machinery as originally intended by Mr. Randall, and the results from the working of the mill were expected to be soon received. On Feb. 19 they were advised that within 10 days the mill would be in operation. He could only speak for himself, that the condemnation of the machinery on the part of the employees of the company, without having fairly tested it was certainly an interference with its designers. The directors had taken steps to ascertain the results of the working of the machinery as soon as possible, and it would be immaterial what their opinion was as to the results, as they would be communicated as soon as known. Advices should have been received by the last mail, but the mails between Curacoa and St. Thomas failed to connect, so that the latest advices to hand were dated Feb. 19; at that date it was expected all the machinery would be in operation in about a fortnight, consisting of 15 stamps, a Blake's stone-crusher, amalgamators, and concentrators. With regard to the phosphate of lime, the question was still before the Courts; they expected to hear by telegram the result of the suit, but it was probable the question had not yet been decided. It was the intention of the directors to keep the shareholders fully informed from time to time of the advices received from Aruba, and they were very hopeful of getting satisfactory results within a short time. He then moved that the report and accounts be received and adopted.

Mr. REMINGTON seconded the proposition.

Upon the proposition of Mr. LLOYD, seconded by Mr. WIDDICOMBE, the re-election of Mr. Ford was unanimously agreed to.

A vote of thanks to the Chairman and directors closed the proceedings.

[For remainder of Meetings see to-day's Journal.]

THE MINERAL RESOURCES OF THE SOUTH-WEST OF IRELAND—No. I.

Having enjoyed the services of one of the most experienced miners in Ireland as our Special Correspondent, we intend, under the above heading, to publish a series of papers on the Mines and Mineral Resources of the South-West of Ireland, as we feel assured that there is no part of the United Kingdom more worthy of the serious attention of the English capitalist, or affording a more legitimate field for the safe investment of capital, than the districts which will be described by our correspondent.

PRELIMINARY REMARKS.—If we draw a line on a map from Baltimore to Bantry, a distance from south to north of about 20 miles, and from Bantry north to Kenmare, in the county of Kerry, a distance of 30 miles, and then include all the headlands and land to the west of the said north and south line, we find a surface area of about 1500 square miles, than which there is probably not a richer mineral (undeveloped) district in Europe. It contains mines of copper ore, silver-lead, silver, asbestos, malachite iron, iron pyrites, both sulphuric and arsenical, manganese, black schist (which carpenters use instead of blacklead pencils), sulphate of baryta, and extensive and valuable slate and slab quarries. There are millions of acres of peat bogs which may be utilised, while the beautiful and noble bays and harbours of Bantry, Kenmare, Dunmanus, Crookhaven, Long Island, Schull, Baltimore, Roaring Water, and numerous other creeks and inlets are literally alive with all kinds of fish, another incalculable source of wealth. The bold and grand coast scenery stands unrivalled, and with all its wealth and natural advantages is comparatively unknown and undeveloped. It is, therefore, perfectly astounding that shrewd, calculating men of business will pass by their next-door neighbour, who offers them a sure and certain profit upon all the money they may invest, and forever lose millions in the "Rocky Mountains" and other foreign bubble schemes. It may be that the south-west of Ireland is too near for cute operators in London to manufacture their schemes, as their clients might take it into their heads to pop over, which may be done in a few hours, and see for themselves, hence probably the disinclination with the knowing ones to direct the attention of capitalists to *bona fide* investments in this country. There is nothing, however, to conceal in an honest speculation, and I would say to the capitalist, before you invest your money "come and see for yourself." Every man is not a miner, but most men of business have common sense; let them come over and exercise it, and they will not go wrong. It is scarcely necessary to remark that no man can perform a certain amount of work with 10,000*l.* when 20,000*l.* is required. I could point out instances where valuable concerns have been started with a nominal capital of 20,000*l.*, out of which 5000*l.* have been actually applied to the works, 5000*l.* more may have gone into the hands of the promoters, and the remainder goes nobody knows where. The poor dupes of shareholders are called together and informed that there is no alternative but to appoint a liquidator and wind-up. A number of people subscribed this money, and lost it; it might just as well have been, as far as they were concerned, thrown into the sea, and the result is that a valuable property is brought into disrepute; it has the name of causing a loss of 20,000*l.*, whereas a tithe of it never found its way into the concern. Promoters and others should, beyond doubt, be paid well and liberally for their time and trouble; but why, in the name of common sense, will not people believe the "truth" instead of a "lie?" Surely mining may be conducted as honestly as any other business. Before I finish these papers I hope to place valuable and legitimate mines before the public; let the public act honestly and faithfully towards each other, and success is certain. In my next I shall begin with certain copper mines, &c.

FOREIGN MINING AND METALLURGY.

The general impression as to industrial operations in Belgium appears little favourable to a revival in affairs during the present season, which is now regarded as practically lost. In all iron-producing countries the same depression prevails, although with more or less intensity, and on all sides there are complaints as to the remarkable reduction which the consumption of iron has experienced. It is a question whether the use of steel, which is becoming more and more general, does not begin to make its influence felt upon the iron trade by delaying the periods at which a renewal of permanent way is required. Another fact which is now well established is this—the total production of all the English, French, Belgian, and Austrian works combined, if it were carried to its maximum development, would more than twice exceed all the requirements of the world; and accordingly they cannot expect to work simultaneously upon favourable conditions. On the other hand, low prices, combined with the superior quality of their products, will enable certain establishments to work at a profit when others are reduced to idleness. There is little fresh to report with respect to the Belgian iron trade; prices remain without variation, and affairs continue to languish. The Belgian Government, taking into consideration the urgent requirements of industry, has invited tenders for 400 coal trucks. A rather important adjudication for carriages, trucks, and wheels will take place at the close of this month at Prague, on account of the Pilsen and Priesen Railway; another adjudication of some little interest has been announced for April 30—800 tons of rails for the Ciudad Real and Badajoz Railway Company.

Generally speaking, at this period of the year the French iron trade is distinguished by large transactions; numerous orders are generally received, and contracts of some scope are entered into. This, however, is not now the case, and the markets are accordingly regarded as heavy. We must not, nevertheless, suppose that there is no business passing; on the contrary, there is rather a sustained current of orders, and some works have even employment assured for two months in advance; but generally speaking transactions are only entered into to meet the immediate requirements of consumption. At Paris iron has been well maintained; a quotation of 9*l.* 4s. per ton, established by the Providence and Pompey forges, for first-class merchants' iron has a tendency to become general; heavy plates remain about stationary. In the Champagne group activity continues to prevail at the works; castings for building and mechanical purposes sustain previous quotations, and railway companies continue to give out a few orders. The Bussy Ironworks have obtained an order for hydraulic cranes for the Eastern of France Railway Company. Iron and sheets are in fair demand in the Champagne group. The stock of pig having increased in the Luxembourg, prices have fallen to 2*l.* 12s. per ton. In the Ardennes charcoal-made pig of ordinary quality is quoted at 4*l.* 12s. per ton; and rolled coke-made at 8*l.* 16s. per ton. In the basin of the Rhône work is being resumed little by little; orders begin to return to the heavy boiler-making establishments, and the works for the construction of railway *matériel*, but we cannot say as much for the great metallurgical works. The high rates charged for the conveyance of coal and minerals, and the dearness of combustibles, leave these last-mentioned concerns in a very difficult position. A company with a nominal capital of 80,000*l.* has been formed for working blast-furnaces, forges, foundries, and construction shops at Mazières, in the Cher. A syndicate of industrials has been formed for carrying out a canal from St. Dizier to Wassy. The works of

this canal would extend over two years, and the syndicate was prepared to advance to the French Government the sum required—120,000*l.*—for the execution of the canal.

The Belgian coalowners—or, at any rate, some of them—show a disposition to attempt an advance in quotations, which is not justified by the actual facts of the case. So far, indeed, from any advance being called for, the collieries are now surrounded with idle blast-furnaces and cold and deserted forges. Upon the whole, it must be said that the attempt just noted to secure higher rates has resulted in failure, and that there has been no serious variation in quotations. Belgian consumers show reluctance to enter into long-termed coal contracts, and they are giving more attention to the English markets and the basin of the Ruhr, which promise them advantages for which they look in vain among their compatriots. The dividend of the Sacré-Madame Colliery Company for 1874 is at the rate of 20 per cent. per annum. It is stated that the extraction can be continued without difficulty for ten years at its present rate.

The French coal markets continue to show a lack of animation. Business is evidently carried through with considerable difficulty. Most of the brickmakers and lime-burners have not renewed their contracts, and they content themselves with making contracts proportioned to their requirements. In the basin of the Rhone coal for forge purposes has been pretty well sustained, but other descriptions of coal have been rather tending downwards. The Lyons Gas Company has reduced the price of its coke. There has been no serious movements upon the Parisian market; English and Belgian coal begins to appear at somewhat lower rates than those current for Belgian coke.

Copper has remained without change at Paris. Upon the German copper markets rather more firmness has prevailed. There have been comparatively few transactions in tin at Paris, and prices have been rather tending downwards. The Paris lead market has been quiet, and prices have ruled rather feeble. The German lead markets have been weak. At Paris zinc quotations have slightly fallen. At Marseilles rolled Vieille-Montagne zinc has brought 30*l.* per ton. The Breslau zinc market has been inactive.

QUICKSILVER, AND QUICKSILVER SMELTING.

In an interesting series of lectures for practical men, recently given by the Professors of the University of California, Dr. BECKER in treating of "Quicksilver" remarked that, except to a mind somewhat used to generalising, mercury seems almost a substance apart, and not in the ordinary sense one of the metals. A moment's reflection however, shows that there is nothing generically peculiar about quicksilver. The relation between the prevailing temperature of the surface of the globe and the melting point of the metals is an accidental and probably a temporary one. There is much less difference between the melting point of mercury and that of lead than between the temperatures at which lead and copper become fluid. The uses to which we put mercury depend to a great extent upon its fluidity under ordinary conditions—gold, for example, would be even better than mercury for barometers, were it only liquid. It is frequently a matter of great convenience to be able to bring water in contact with melted metal, and with the exception of an alloy or two, which melt just below the boiling point of water, mercury is of course the only metallic body available in such cases. A vast proportion of the mercury yearly produced is employed in amalgamation. Most of the remainder is consumed in the manufacture of vermilion paint and mercurial drugs. Quicksilver sometimes occurs native in connection with its ores, but generally in inconsiderable quantities. It is also sometimes an ingredient of a complicated mineral called tetrahedrite, but by far the most important ore of mercury is the sulphide called cinnabar, and identical in composition with the vermilion of commerce. The largest deposit of this ore is at Almaden, in Spain. The Almaden Mine has been worked since 700 B.C., and is scarcely even well developed yet. The second largest deposit is at New Almaden, in California, but as far as has at present been ascertained it does not approach the Spanish deposit in value.

Quicksilver belongs to the same general group of metals as gold and silver, and like them its affinities are weak, or in other words, its compounds are readily decomposed. The beneficiation of cinnabar depends upon the fact that sulphur unites with much more strength with most other substances than it does with mercury. If cinnabar be heated with lime the sulphur of the ore combines with it, forming sulphide and sulphate of lime, and leaving metallic mercury. If we heat cinnabar in a current of air the mineral is also decomposed; the sulphur unites with the oxygen of the air to sulphurous acid, the unpleasant smelling gas we have met so often in these lectures, and metallic mercury is again left behind. Quicksilver possesses a property which greatly simplifies the operations subsequent to its isolation in a metallic form. It is highly volatile, and boils at a temperature of 675°. It, therefore, distils off from the ore during the roasting, and only requires to be conducted through proper condensing apparatus to be liquified and obtained in a marketable shape. If gold and silver were but volatile at furnace temperatures we could beneficiate their ores in the same way—*i.e.*, sufficiently volatile; for, though we cannot distil these metals in any ordinary furnace, very small amounts of gold and silver do pass off as vapour when they are melted, and their volatility is consequently great enough to necessitate troublesome precautions, and to occasion loss, though it is insufficient to be turned to practical account. Retorting quicksilver ores with lime is a method of beneficiating them now seldom practised, except for assay. When used this method differs but little from the retorting of amalgam. The retort is filled with a mixture of cinnabar and lime, and heated. The mercurial vapour passes out of the retort through tubes, cooled with water, and the liquid quicksilver drops from the end of the tube. The retorts are sometimes made so that they can be charged from the outside of the furnace, and thus be kept at work continuously. A larger percentage of the metal is obtained than by the process of roasting; but the cost of apparatus, labour, and extra fuel more than compensate for the gain under ordinary conditions.

The oldest cinnabar roasting furnace still, or until recently, in use is the Busamente furnace. In this apparatus the ore and fuel are charged together in a short vertical shaft, and air is admitted from below and from the side. When the fuel is incandescent, the air decomposes the cinnabar and the volatile products, sulphurous acid, mercurial vapour, and carbonic acid, pass off through flues into two large square chambers, where the gases are somewhat cooled. At some distance there is a second pair of chambers, and the two sets are connected by several tubes. These tubes are formed of short joints, and each joint is an earthen vessel swelling at the middle, and with one end larger than the other, so that the small end of one "aludel," as these vessels are called, may be thrust into the large end of the next. The joint is made with clay. These composite tubes slope from each end towards the centre, and rest on a foundation of masonry. The mercurial vapour passing through this tube is cooled down and the metal is deposited in drops, which an account of the inclined position of the tubes run down to the central point. A small hole in the under side of the aludel occupying that position allows the metal to escape and collect in vessels set to receive it. So much of the vapour as escapes condensation in the aludels passes into the second set of chambers, where another portion is liquified, and the remainder passes out into the air and is lost. Besides the metallic quicksilver, another product is condensed called soot. Its composition varies, but it contains flour of mercury—*i.e.*, quicksilver in exceedingly minute globules; undecomposed sulphur of mercury, for cinnabar is itself volatile, and when air is not brought in contact with it may be distilled unaltered; calomel, when there has been any salt in the ore, and soot proper, formed by the imperfect combustion of the fuel. This product is collected and worked over by hand with lye to cleanse the minute globules of the metal from impurities, whereupon a large portion of them unite to drops, and are thus recovered. The remaining matter is added to the ore at the next charge. The mixing of fuel and ore, as practised in this furnace, has one great disadvantage. If at any time there is more fuel than there should be too great a heat is produced, and if there are easily fusible compounds in the ore, such as silicate of iron, a glaze is produced which in this, as in all roastings interferes very much with the proper action of the air upon the ore. The aludels, too, are somewhat difficult of manipulation, and it is very hard to make the joints between them tight, and no one would now build a furnace on this plan

The New Almaden furnace consists, in the first place, of a large square shaft, two opposite sides of which are broken through with numerous openings. This shaft is filled with lumps of ore, so arranged as to leave passages through the mass, but no fuel is mixed with it. The fire-place is placed on the outside of one of the perforated walls; but the flame strikes through the perforations into the ore, and the gaseous products of the process pass through the opposite wall into a series of condensers. The condensers are large chambers of brick, wood, iron, or glass, in which there are cross-walls, and these cross-walls are broken through alternately at the bottom and the top to admit of the passage of the vapour, but at the same time to compel it to take a circuitous course. This at once lengthens the distance over which it must pass, giving it time to cool, and, by producing gentle eddies in the current, favours the fall of minute particles of solid or liquid matter. The floors of the chambers are curved and slope towards the outside wall, so that the metal as it liquifies may collect at one point in each chamber, whence it may either be allowed to run out continually through a small opening, or may be tapped when accumulated. As the vapour must be cooled down as far as practicable, the natural draught is very slight, and a tall chimney, generally with a small fire in it, is needful to draw in the requisite amount of air through the grate. The working is very simple, the fire is gradually increased from the start until, after from three to four days, the mass of ore has come to a moderately bright red-heat, plenty of air being admitted all the time. When this point has been reached the distillation is considered complete, and the furnace is closed up and allowed to cool. As soon as it is cold the exhausted ore is removed through suitable openings, and the furnace is re-charged.

The necessity for allowing the furnaces to cool before re-charging involves great loss of time and fuel. The first furnace devised to allow of a continuous working was the Hähner furnace. In this the ore and fuel are charged together into a shaft, the bottom of which consists of a grate with movable bars. By removing one or more of these bars the lumps of exhausted ore can be allowed to drop from the furnace, while fresh material is added at the top. The condensation chambers are arranged as in the Almaden furnace. The continuity of the Hähner furnace is a great advantage, but not the mixing of the fuel and ore. It has consequently been modified so as to resemble furnaces long in use for ores of other metals, by allowing the flame from one or more outlying fire-places to strike into the shaft filled with the ore alone. An important advantage is gained, as in the exceedingly similar Swedish roasting furnace, by placing the openings for the entrance of the flame some distance from the bottom of the shaft, and allowing the air for roasting to enter at the opening intended for withdrawing exhausted ore. In this way the air is heated by the hot worthless material, and the heat thus returned to the upper portion of the furnace. The Knox and Osborne furnace of California, and the latest furnace of the works at Idria, Southern Austria, correspond to this general description. The former is provided with a single fire, which draws straight across the column of ore in the shaft, and is built of heavy brick walls. The Idria furnace, of which a copy is now putting up at New Almaden is provided with three fire-places, which draw through nearly three-quarters of the height of the column, the gases passing out through openings close to the top of the furnace. The walls are of a construction first adopted in England for iron blast-furnaces, and since applied with great success to a variety of other furnaces—a comparatively thin lining of fire-brick surrounded by an annular space filled with air, answering admirably as a non-conductor of heat, outside of which is another thin wall of brick, enclosed in a shell of boiler iron. The charging apparatus is also borrowed from blast-furnace construction, and is of the kind called Parry's bell and hopper. The mouth of a conical hopper is closed by drawing up into it an upright suspended cone. When the hopper is filled the cone is lowered, and the ore enters the furnace, but its fall is broken by the presence of the cone, and it is thus necessarily distributed in all directions in the furnace. The cone is instantly raised again, and thus shuts off the escape of gas.

The condensers of a quicksilver roasting furnace form, of course an exceedingly important portion of the structure, and no absolutely satisfactory construction has thus far been hit upon. Brick is an exceedingly porous material, and quicksilver filters through it and is absorbed into it by the almost resistless force of capillary attraction. Some years ago, in pulling down an old furnace at New Almaden, it was found that the metal had penetrated the foundation and the earth for over 30 ft., and down to the bed-rock. Since then the furnaces have been built on arches, and in the pillars on which the arches rest sheet-iron plates have been placed to intercept the metal in its downward course; much metal, however, undoubtedly penetrates the outer walls of the condenser, and is evaporated from the surface; for mercury evaporates, more or less, at all temperatures above the freezing point of water, and the condensers, though built of a very considerable thickness, are, of course, somewhat warm on the outside. On the other hand, the thicker the condensers the less does the vapour inside cool; and, as it must cool to condense, the necessity for thick walls renders a large number of condensing chambers indispensable. It is natural, therefore, to seek some material better adapted to the work required than brick. Cast-iron and wrought-iron answer very well for condensers so long as the gas is hot, but when the temperature falls below the boiling point of water a very disagreeable action sets in.

Sulphurous acid, heated with air in contact with highly porous substances, is partially converted into sulphuric acid; this condenses with the water, and attacks and soon destroys the iron. Wood withstands this action tolerably well, and does not let quicksilver through, like brick. It has, consequently, been much used for the later condensers of the series, but wood is a non-conductor of heat, and hence, properly speaking, ill adapted for cooling apparatus. At New Almaden glass is found to answer excellently, being a much better conductor of heat than wood, though not so good a one as iron, and being, of course, quite unaffected by the acid liquids. The condensers assume a great variety of forms, such as chambers of various shapes and tubes; columns of coke are also used with some success as final condensers. The draught is sometimes kept up by the aid of a chimney, with or without the help of a fire to give the air in the stack additional buoyancy, and sometimes by a suction fan, or a "water drum"—an apparatus which sucks in air by means of the friction of a jet of water. So far as the condensation is concerned an artificial blast would be preferable, but the danger of blowing jets of metallic vapour through fine cracks in the apparatus would be too great to admit of its employment. The losses in quicksilver smelting are various, and very important, though they are not all very well understood. There are the losses by vaporisation and by the fine dust of mercury suspended in the gas, nothing being more difficult on the large scale than to filter the former from the latter. The metallic mercury obtained from the condensers rarely needs any refining. Dirt mixed with it is readily extracted by filtering through cloth or leather, and it is then simply weighed out and bottled up in flasks ready for market. The metallurgy of quicksilver is thus comparatively simple, consisting essentially of but a single and by no means complicated process. The working of quicksilver ores is unquestionably susceptible of great improvements, but it is only lately that a sufficient number of cinnabar mines have been known to give employment to more than an exceedingly small number of technologists. In the future, emulation and competition will, probably, produce rapid advances.

UTILISING SLAG.—Mr. H. C. PATERSON, of Glasgow, proposes to construct or manufacture bricks, blocks, and other articles from slag by casting them whilst the slag is in a liquid state, and then immersing them in hydro-carbon.

AIR-COMPRESSING MACHINERY.—Messrs. E. COPE and J. R. MAXWELL, of Hamilton, U.S., have patented some improvements in steam pumping or air compressing engines and machinery. The improvement consists in the structure and arrangement of the main and auxiliary steam-valves and their connections with steam ports and passages for admitting and exhausting steam from the auxiliary cylinder for working the main steam-valves; also in a skeleton piston-head for making it lighter, and cheapening construction; also in the manner of working the steam-valve for dispensing with the use of packing usually employed for making joints; also in constructing, arranging, and combining a governor with direct-acting steam-engines; also in using two or more air-compressing cylinders of the same or different capacities in the same machine for compressing air, for lessening the power and cylinder capacity, for doing a given quantity of work, and constructing the pump to force a continuous stream by using one set of suction and delivery valves.

GOLD IN SCOTLAND.

A memoir entitled "Historical Notes on the Occurrence of Gold in the South of Scotland," which has been printed for private circulation, has just been issued by Mr. PATRICK DUDGEON, F.R.S.E., F.S.A., Scot., a gentleman who has long devoted much attention to the subject in question. It contains a large amount of interesting information in reference to the early working for gold in Scotland, and many of the facts will doubtless be new to the large bulk of our readers, most of whom, however, are doubtless well acquainted with the general fact that gold has been known for several centuries in the district which gives rise to the head waters of the Clyde, the Tweed, and the Nith and Aiman.

Various localities are mentioned in old grants which were made to different parties to search and mine for gold, but the most important is the district which we have just referred to, and which embraces Crawford Moor, Leadhills, Wanlockhead, and their immediate surroundings,—the amount obtained in three years' washing in the Crawford Moor district being, it is stated, as much as 100,000*l.* sterling; and various authorities mention that nuggets varying from 2 grs. to 30 ozs. have been found.

Vestiges of gold workings have often been seen in the valleys of the rivers draining the watershed which forms the uplands between Lanarkshire and Dumfriesshire. They were spoken of so long ago as 1792 by Sir John Sinclair in his "Statistical Account of Scotland;" and quite recently Prof. Geikie and Mr. R. L. Jack, while prosecuting their labours in connection with the Geological Survey of the South of Scotland, have noticed the remains of what are undoubtedly ancient gold-washing places. Mr. Dudgeon states that the earliest official notice which he has been able to find regarding gold in Scotland is one which occurs in a grant made by King David I., A.D. 1125, to the Church of the Holy Trinity of Dunfermline. There is likewise an Act of James I., A.D. 1424, which contains the following quaint utterance:—"Gif ony myne of golde or silver be fudyn in ony lordes landes of ye realme, and it be prwyt tht thre half-penys of silver may be fynit owt of ye pund of leid, the lordes of parlimet consentes tht sik myne be ye kinges as is usual in other realmys." This, excerpt from the Act referred to, is not only quaint, but it is exceedingly interesting from a metallurgical point of view, inasmuch as it satisfactorily proves that even at that very early period in the history of the industrial arts in Britain the somewhat complicated process of separating silver from argentiferous lead was known and practised. In the form of a footnote Mr. Dudgeon says,—"As no silver halfpenny of the reign of James I. is known to exist, the weight of this coin is somewhat uncertain. The groat of this reign may be taken to weigh about 36 grs.; the weight of the halfpenny would, therefore, be about 4½ grs., so that three silver halfpennies to the pound of lead would represent 15½ grs., equivalent to about 62 ozs. to the ton of lead.

During the reign of James IV., who was a great dabbler in alchemy, a considerable amount of attention was paid to the subject of gold in Scotland; indeed, the royal alchemist appears to have worked the mines in Crawford Moor in the years 1511-13. James V. also devoted attention to gold mining in the same district. He had upwards of 300 men employed (many of them Germans) in the gold washings, and during several summers the washings yielded above 100,000*l.* in English money. In the reign of James VI. the work was still continued under royal authority, one of the parties to whom grants to "search and try for gold" were given being Stevin Aitkensoun, an Englishman. The conditions in the grants generally were that all gold found was to be sent to the Mint in Edinburgh to be coined, one-tenth of the coinage to be retained for the Crown, and nine-tenths to be delivered to the finder. It would seem that the search was never successful or remunerative in any other district besides that of Crawford Moor. The famous Edinburgh goldsmith, Thomas Foullis, obtained a grant from James VI. in the year 1593, to work the gold, silver, lead, &c., mines in Crawford Moor and Glengonar, for 21 years, in consideration of the great sums due to him "and his dearest spouse." In a book entitled "Discouverie and Hystorie of the Gold Mynes in Scotland," which was published by Steven Atkinson in 1619, mention is made of a Mr. George Bowes, an Englishman, who procured a commission to work the gold mines in Scotland. He is said to have discovered at Wenlocke Head "a small vaine of golde which had small gold upon it." He swore his workmen to secrecy, and after working the vein for some time he carried off to England a considerable quantity of the gold, but before leaving he caused the shaft to be covered over and concealed. At another place Mr. Bowes erected a stamping-mill, and by this means "used to gett small mealy gold."

One of the most interesting parts of Mr. Dudgeon's memoir is that which embodies a great deal of exceedingly valuable information from a manuscript belonging to the Cattonian Collection in the British Museum, and which seems never to have been previously published. There is no date on the manuscript, and unfortunately it has been a good deal damaged by fire, in consequence of which the reading is rather fragmentary. There seems to be good reason to believe that the writer of the manuscript had employed some person to visit and report upon the gold-bearing district of Crawford Moor and the surrounding localities. There is sufficient evidence, says Mr. Dudgeon, to prove that gold in this district was found in no inconsiderable quantity, and Dr. Lander Lindsay, in a paper submitted to the Geological Society of Edinburgh, says that some centuries ago upwards of half-a-million of gold was obtained by a systematic method of working, but he does not give the data on which he founds this assertion.

Various attempts have been made in recent years to work the gold in the district reserred to so frequently in the foregoing remarks, but the metal has never been found in paying quantities, and all idea of now working it profitably appears to be quite abandoned. Still, however, gold can always be found in small quantities in the sand of the various streams of the district, and in the older alluvium. Indeed, some of the miners at Wanlock Head and Leadhill wash for it occasionally, and can always procure it for any person who desires to obtain specimens. But the gold obtained in this way generally costs the purchaser much above its intrinsic value, for the miner who collects it charges so much a-day for washing, and the gold in many instances is found to cost near 1*s.* per grain. Three or four ounces were collected some years ago for her Grace the Duchess of Buccleugh, and about the same quantity was recently collected for the Countess of Hopetoun, and made into ornaments. Sir T. E. Colebrooke, Bart., M.P., and other persons connected with the district have also obtained small specimens during recent years.

All the gold recently collected has been got from the streams in small grains, but in the olden times there was "great gold, like Indian wheate or pearle, and black-eyed, like to beans." There is in the possession of the Earl of Hopetoun a small nugget of Crawford Moor gold, weighing 209 grains. It was found 70 or 80 years since. The late Dr. Martin, of Leadhills, had in his possession a nugget weighing about 1½ oz., which was found many years since near Wanlochhead, the adjoining village. Doubtless auriferous veins must exist in the district, but the vein mentioned by Atkinson in his "Discouverie and Historie" has never been re-discovered, and it is only very rarely that any gold is found in the matrix, and it has only then been obtained in detached pieces, and never *in situ*.

The gold of the South of Scotland, like all other Scotch gold, seems invariably to contain a considerable percentage of silver. A specimen which was got in the Crawford Moor district was sent to Prof. A. H. Church, and found on analysis to yield the following results:—Gold, 86·60 per cent.; silver, 12·39 per cent.; iron, ·35 per cent.; other substances and loss, ·66 per cent.: total, 100 per cent. Mr. Dudgeon's memoir is accompanied by an illustration of a nugget of auriferous quartz of the natural size, found at Wanlockhead by a miner in the year 1872. It is printed in chromo and gold, and adds greatly to the "Historical Notes," to which, by the way, it does service as a frontispiece.

ORMEROD'S NEW PATENT SAFETY-LINK.

FIG. 1.

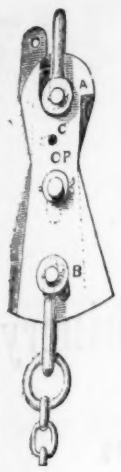


FIG 2

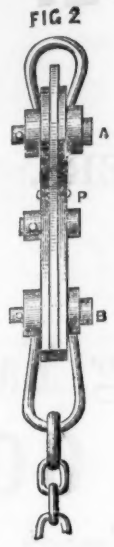


FIG. 3.

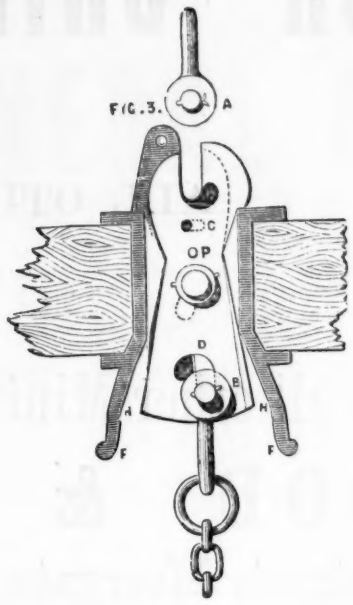


FIG. 4.

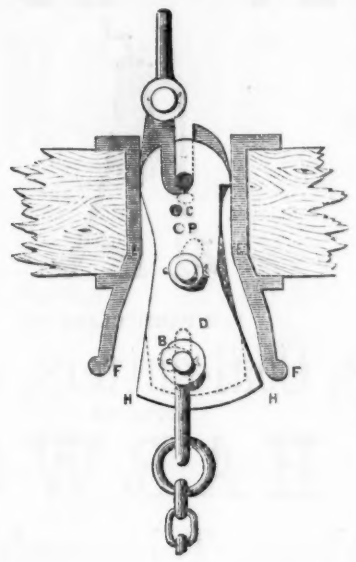
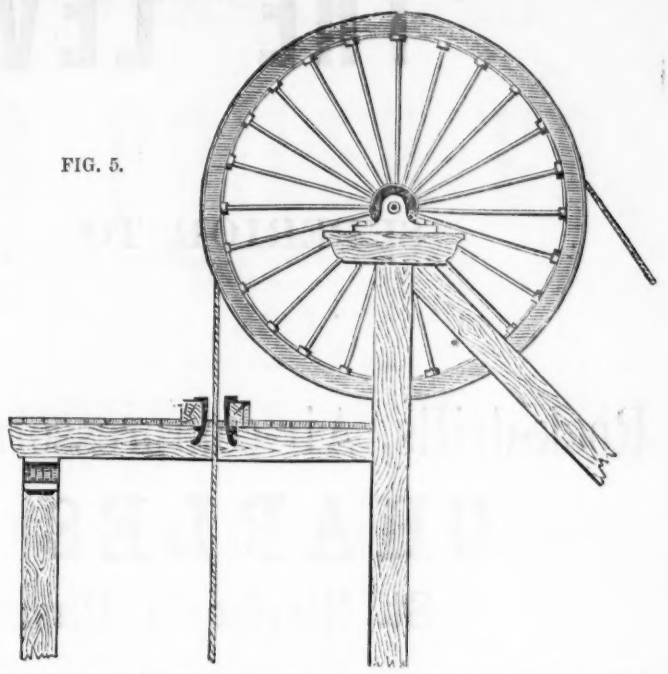


FIG. 5.



ORMEROD'S NEW PATENT SAFETY-LINK.

Notwithstanding the many improvements which have been made in machinery for winding purposes, in spite of the powerful brakes and apparatus placed so easily under control for instantly stopping the drum, it must still be a source of regret that overwinding can and does occur. A slight error in judgment, a moment's inattention, the least possible neglect, and the cage flies over the pulley, carrying destruction, and possibly death, with its course. Various methods have been tried to avert this calamity, but by far the most successful is Ormerod's Patent Safety-Link. This apparatus, which consists of an expanding link on the end of the winding rope, and to which the chain carrying the cage is attached, has already been effectual in an immense saving of property, and, in some instances, valuable lives. Its action is as follows:—In a case of overwinding at whatsoever speed, as soon as the apparatus arrives at a spot below the pulley it passes into a bell-mouthed cylinder, which closes the bottom part of the link, and expands the top, so as to catch over the cylinder, and at the same instant releasing the winding rope, and blocking itself, with the cage suspended firmly in the head-gear. But after being extensively adopted, and, in many cases, put practically to the test, it was found that so far as being a safety link was concerned it was perfect; still it locked itself so firmly when wound-up into the bell-mouthed cylinder, that to release it and lower the cage a work of no little risk and considerable delay was involved.

We are, however, glad to see that by a recent patent Mr. Ormerod has so modified the apparatus as to entirely overcome this objection. According to this improvement, as soon as the winding rope or other tackle is at hand it can be attached to an ear in the top part of a link, and by simply removing a bolt the apparatus, and with it the cage, can be immediately and safely lowered. Mr. Ormerod also places a substantial platform in the head-gear, for the better convenience of the man while re-attaching the rope.

With these preliminary remarks we may now proceed to the descriptions of our Figs. 1, 2, 3, 4, and 5, the first two of which represents respectively a side and cross view of the link, while Fig. 3 shows the position it assumes when wound-up into the cylinder, the rope-shackle being disconnected, and the link firmly locked into its position. Fig. 4 shows the rope-shackle re-connected for lowering the link through the cylinder. Fig. 5 shows a section of the cylinder as fixed in the head-gear or pit-frame, also the platform for convenience in re-connecting the rope-shackle.

It will be seen on reference to the engravings that the apparatus when in ordinary use, as in Fig. 1, is wider at the bottom than at the top; but, in the event of overwinding, the link is drawn into the bell-mouthed cylinder, FF in Fig. 4, the wide part of the link at HH coming in contact with the cylinder at EE, thereby closing the bottom part of the link, and causing the top part to expand, and the projections to catch over the top of the cylinder; at the same time, the rope-shackle, A, is forced out of its seat, and allowed to go free, and the bottom shackle, B, drops into the slot, D, locking the link firmly in its position. The cage, being suspended from the chain, cannot fall back. To prevent the possibility of the link becoming disarranged in ordinary work, a small pin, P, is inserted through the plates, which pin is sheared off as the apparatus passes into the cylinder. For lowering the cage the shackle is attached to the ear on the middle plate, Fig. 4. On removing the pin, C, and slightly winding the rope, the middle plate—having a slotted hole in the pin—is elevated into the position shown, and allows the apparatus to pass down through the cylinder, and safely lower the cage. A platform, as we have already stated, is provided on the head-gear, as shown in Fig. 5, for the convenience of the man attaching the rope, and allowing him to do this without incurring any risk. On the whole, Mr. Ormerod's new patented improved safety-link seems all that can be desired, and we hope it may be still more extensively used in the prevention of accidents from overwinding.

FIRELESS LOCOMOTIVES.—An interesting account is given by an American paper of the "fireless locomotives" employed on a city and suburban railway in New Orleans. The lode is about six miles in length. From the centre to the outskirts of the city it is operated upon by mule power; then the mule is taken from the car and the little fireless locomotive is attached, which operation is accomplished in less time than would be occupied in attaching another mule. The train is then off like a rocket, the driver still on the platform of the car working the engine. The car is stopped and started quicker than when drawn by the mule. The railway (double track) is in the middle of a very wide street, and is a little raised, so that it cannot be crossed by carriages except at the street crossings; thus, being somewhat isolated high speed is admissable. The locomotive is simply a cylinder of boiler iron perhaps 3 ft. in diameter and 10 ft. long, mounted on four wheels, and partly filled with water. The engine (a double vertical) is attached to the end of the cylinder next the car, being within reach of the driver. The cylinder is then filled with steam, at a proper pressure, from a stationary boiler at Carrolton, when the locomotive is ready, and it will run to the city and back without care or expense. There is no fire, no ashes, no pumps, no danger, and less noise than from the hoofs of horses. The expense of this means of propulsion is, it is stated, less than by mules. The cost of the locomotives is $1250, each of which includes the builder's profit. The railway is under the management of General Beauregard, who is a skilful engineer, and, although although under under other running arrangement it had become nearly valueless, is now a profitable concern.

A BOILING LAKE.—Mr. Joseph Sturge, of Birmingham, who has come home in the Tagus, writes:—"A discovery of some interest has been made in the island of Dominica. Drs. Freeland and Nichols, Capt. Gardiner, and Mr. Watt, exploring the steep and forest covered mountain behind the town of Roseau, came upon a boiling lake about 2500 ft. above the sea level, and 2 miles in circumference. When the wind cleared away for a moment the clouds of sulphurous steam with which the lake was covered, a mound of water was seen 10 ft. higher than the general level, and caused by violent ebullition. The margin of the lake consisted of beds of sulphur, and its overflowing found exit by a waterfall of great height."

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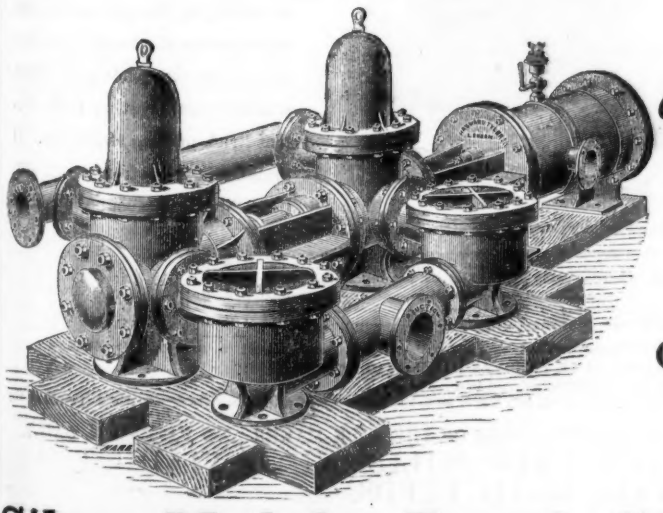

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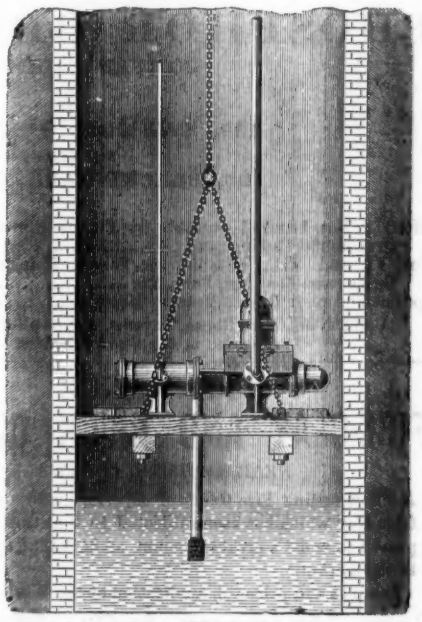

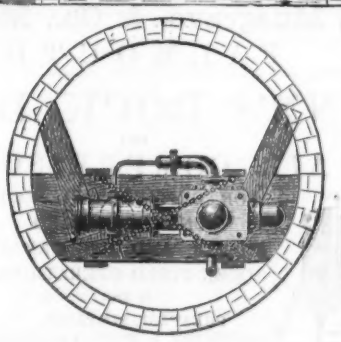

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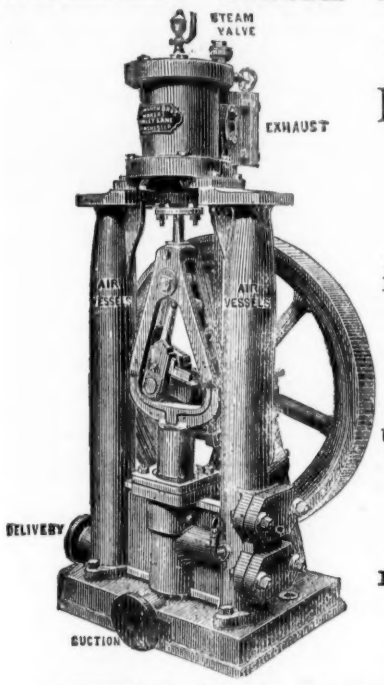

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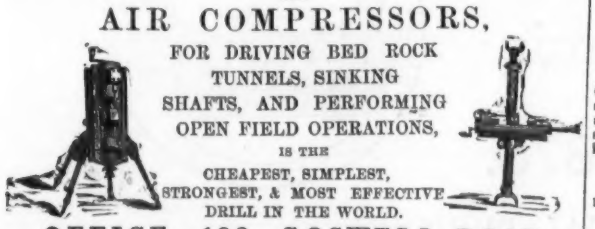

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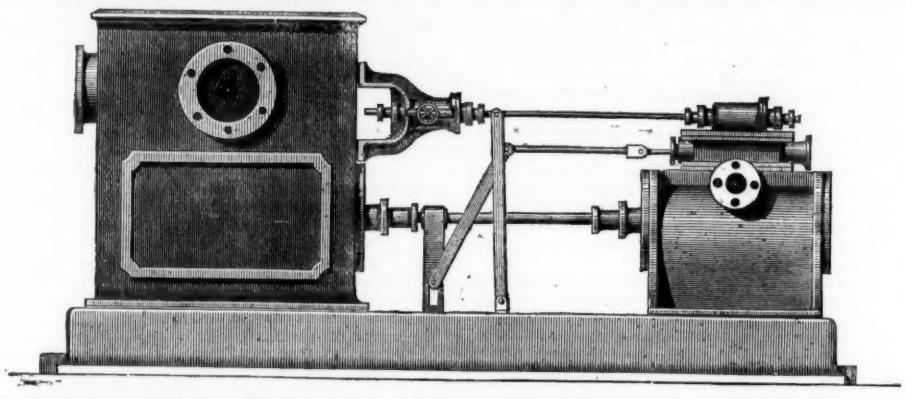

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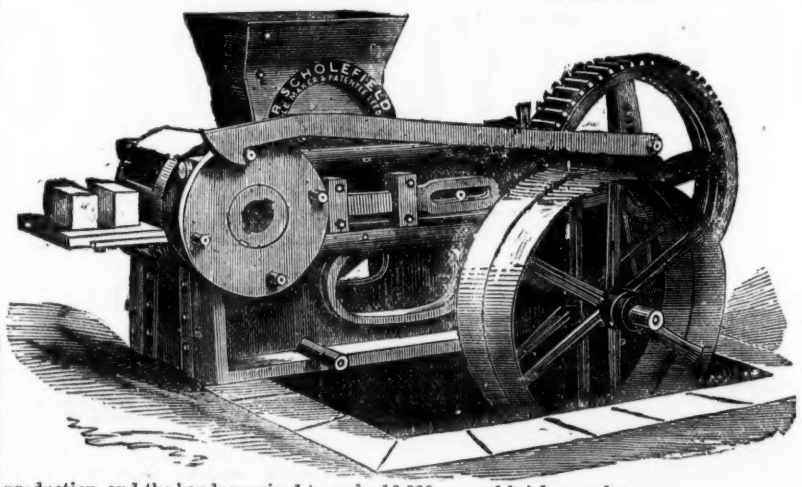

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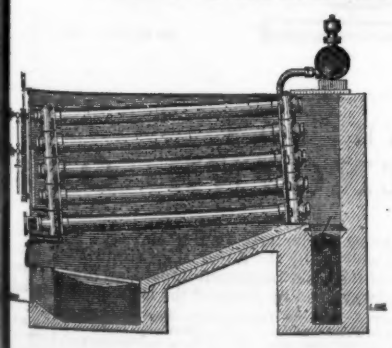

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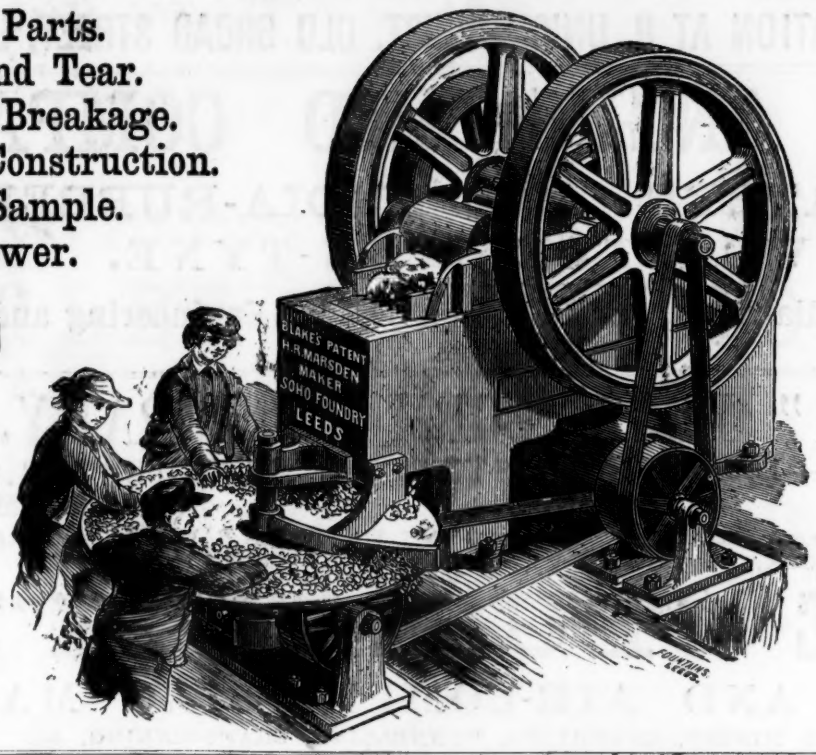

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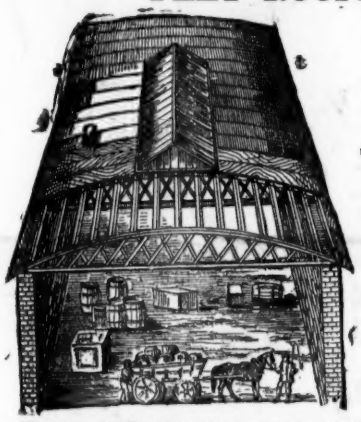

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